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WAR MACHINE

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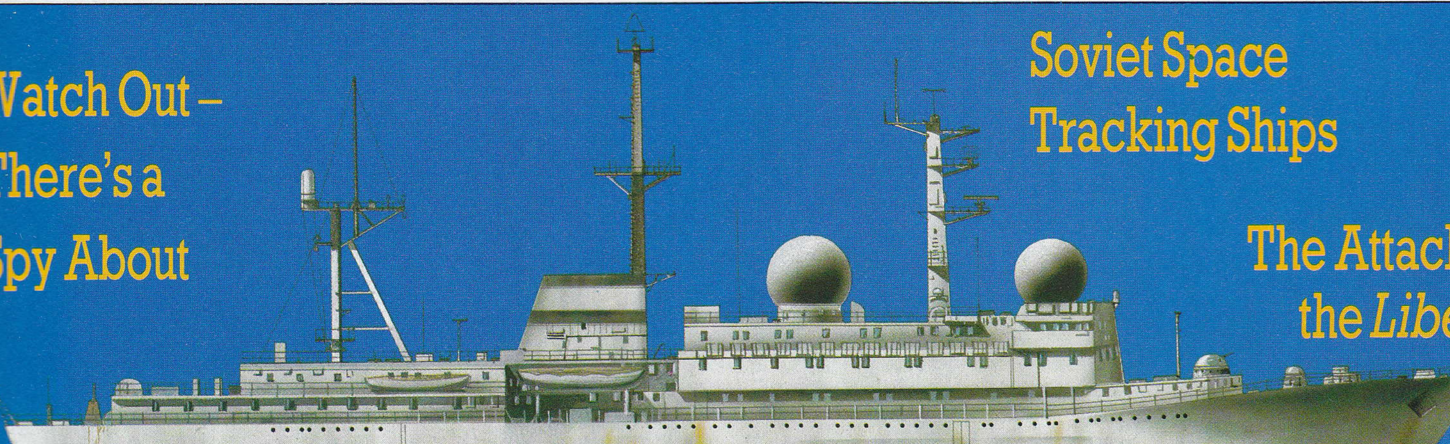

Watch Out – There's a Spy About

Soviet Space Tracking Ships

The Attack on the *Liberty*

A fully illustrated guide to Spyships

WAR MACHINE

Volume 9 **Issue 100**

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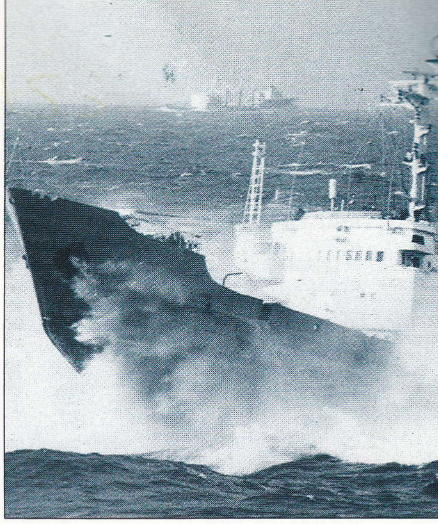
Spyships

From the tranquil calm of a Mediterranean summer to the awesome force of an Atlantic winter, NATO mariners are accustomed to uninvited guests joining their exercises. Whether in small trawler-derived vessels or in large space research ships, the gathering of naval intelligence has become a major preoccupation of the Soviet navy, reciprocated to a certain extent by a number of other navies.



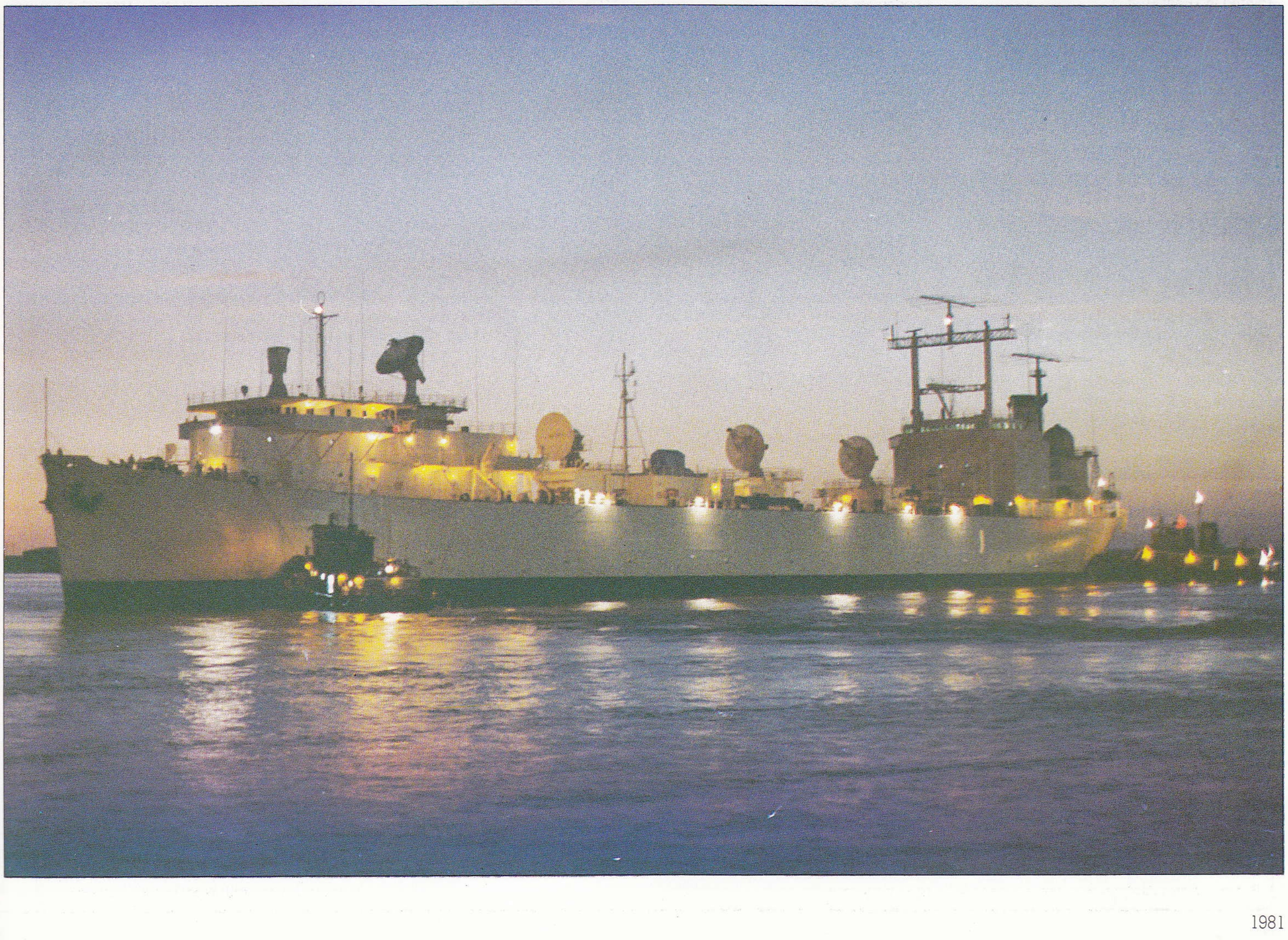
One requisite for any sailor aboard a Soviet AGI is not to suffer from sea-sickness, as this Moma *demonstrates as she watches the warships HMS* Tiger *and the RFA* Tidepool *during the 1974 NATO exercise 'Northern Merger'.*

Although this is the age of satellite-based reconnaissance systems, there is still a need for the intelligence-gathering ship to ply its trade off foreign shores. Such ships are now divided into two categories: the authentic 'spyship', or intelligence-gathering auxiliary (AGI) to give the type its correct name, which is covered with various aerials and antennae to gather signal and electronic intelligence data; and the more respectable civilian research vessels of the space event type, which although tasked with genuine peaceful missions are in fact engaged on occasion in obtaining useful information on foreign military missile tests.

In the Soviet Union there is no real distinction between the two categories as all military and civilian ships of whatever class are operated as part of the Soviet Ocean Surveillance System (SOSS), while the space event units also perform additional military tasks such as relaying communications. The Americans in contrast have lost interest in the AGI following the attack on the USS *Liberty* during the 1967 Arab-Israeli war and the seizing of the USS *Pueblo* by the North Koreans a few years later. They now rely on this type of work to be performed by the Project Holystone nuclear submarines and by aircraft. However, they do remain interested in the research type vessel as shown by the recent conversion of the USNS *Observation Island* to carry the 'Cobra Judy' surveillance radar. One exception to this has been the building of the SURTASS-equipped ships of the 'Stalwart' class to complement the SOSUS network around the coasts of the USA.

Those other countries which operate these vessels (such as France, China and some of the Warsaw Pact nations) tend to use either one or other of the categories but not both. Surprisingly, of the NATO nations only West Germany uses AGIs, the others relying on warships, submarines and specially configured aircraft to do the job.

Originally converted from a tanker design, the USNS Redstone *first served as a tracking and communication vessel for the Apollo moon programme. She has since been assigned to the USAF Eastern Space Missile Center at Patrick AFB in Florida.*



FRANCE

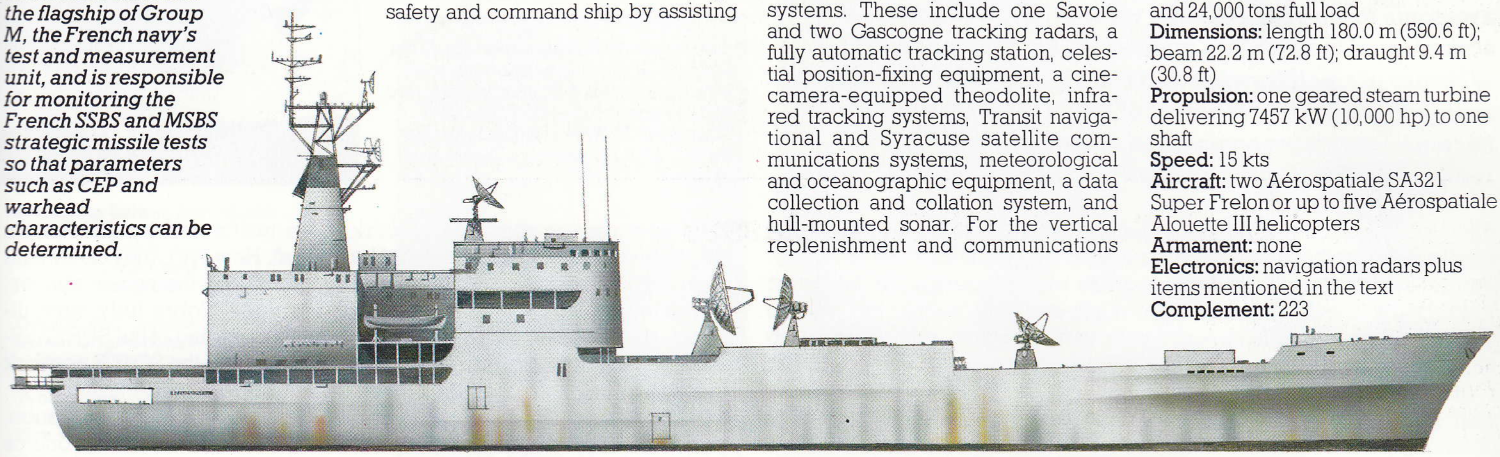
'Henri Poincaré' class

The ***Henri Poincaré*** is the sole ship of her type and the flagship of Force M, the French naval test and measurement group, which takes measurements and conducts experiments as requested by the navy or any other organization, civil or military. The *Henri Poincaré*'s chief mission is to monitor and measure the trajectory of the SSBS (IRBMs) and MSBS (SLBMs) fired from the experimental station at Landes (or from missile-carrying submarines) in order to compute their flight characteristics, especially in the re-entry and impact stages. During such tests the *Henri Poincaré* also acts as the range safety and command ship by assisting the flag officer-in-charge in controlling the naval and air elements in the test zone, particularly in the final descent and recovery phases.

Built originally as an Italian tanker, the *Henri Poincaré* was reconstructed at Brest between 1964 and 1967, a second major refit following between 1979 and 1980 to update her electronic systems. These include one Savoie and two Gascogne tracking radars, a fully automatic tracking station, celestial position-fixing equipment, a cine-camera-equipped theodolite, infrared tracking systems, Transit navigational and Syracuse satellite communications systems, meteorological and oceanographic equipment, a data collection and collation system, and hull-mounted sonar. For the vertical replenishment and communications tasks she has a hangar and flightdeck aft for either two Aérospatiale SA321 Super Frelon heavy-lift or up to five Aérospatiale Alouette III light communications/transport helicopters.

Specification

'Henri Poincaré' class
Displacement: 19,500 tons standard and 24,000 tons full load
Dimensions: length 180.0 m (590.6 ft); beam 22.2 m (72.8 ft); draught 9.4 m (30.8 ft)
Propulsion: one geared steam turbine delivering 7457 kW (10,000 hp) to one shaft
Speed: 15 kts
Aircraft: two Aérospatiale SA321 Super Frelon or up to five Aérospatiale Alouette III helicopters
Armament: none
Electronics: navigation radars plus items mentioned in the text
Complement: 223



The Henri Poincaré is the flagship of Group M, the French navy's test and measurement unit, and is responsible for monitoring the French SSBS and MSBS strategic missile tests so that parameters such as CEP and warhead characteristics can be determined.

CHINA

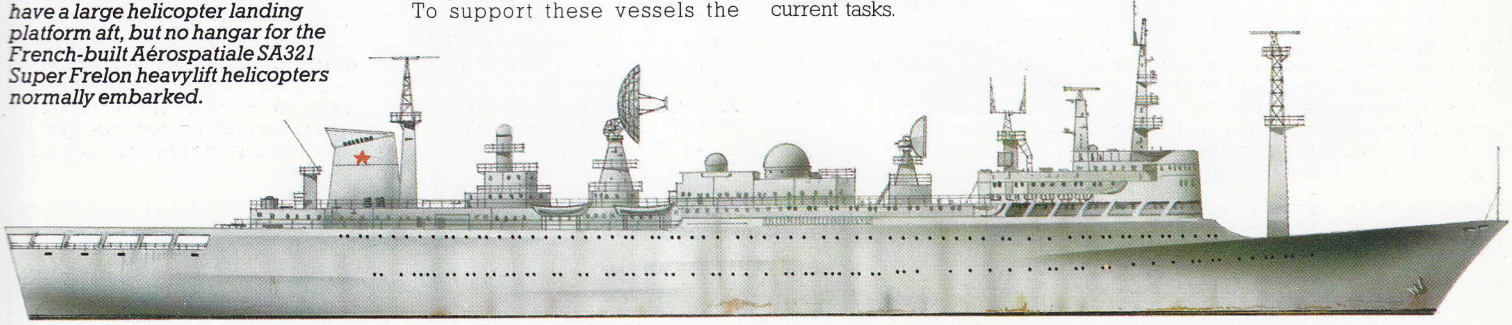
'Yuan Wang' class

First seen during the May 1980 ICBM test series in the central Pacific, the **'Yuan Wang' class** of satellite- and missile-tracking ships is an important part of China's space technology and missile-testing programme. The two vessels, the ***Yuan Wang 1*** and ***Yuan Wang 2***, were built by the Jiangnan Shipyard at Shanghai and commissioned in 1979. For their tracking and monitoring duties they carry a large parabolic tracking antenna amidships, two log-periodic HF antennae (fore and aft) shaped like 'fish-spines', two small missile-tracking radars and several precision theodolite optical tracking director stations. There are also several additional positions available for the later installation of equipment. For vertical replenishment and personnel transfer there is a large helicopter deck located aft, but this lacks hangar facilities. A helicopter type known to use the deck is the heavy-lift Aérospatiale SA321 Super Frelon. A bow thruster and retractable fin stabilizers are fitted for station-keeping and stability in rough seas.

To support these vessels the Chinese Academy of Sciences also has a fleet of research ships sailing under the name **'Xiang Yang Hong'** (East is Red) and individual numbers. These vessels are capable of a wide variety of duties including general oceanographic, upper atmosphere, missile and satellite research, and also hydrometeorology. Further vessels of an **'Improved Yuan Wang' class** are expected to be built in the near future as the Chinese space programme gathers momentum towards the eventual launch of a manned spacecraft. Such vessels will then assume the communications relay role as well as the current tasks.

Specification

'Yuan Wang' class
Displacement: 17,100 tons standard and 21,000 tons full load
Dimensions: length 190.0 m (623.4 ft); beam 22.6 m (74.1 ft); draught 7.5 m (24.6 ft)
Propulsion: one diesel powering one shaft
Speed: 20 kts
Aircraft: helicopter landing deck only
Armament: none
Electronics: navigation radars plus items mentioned in the text
Complement: 300-400



The Yuan Wang class was first observed during the 1980 Chinese ICBM tests in the central Pacific. They have a large helicopter landing platform aft, but no hangar for the French-built Aérospatiale SA321 Super Frelon heavylift helicopters normally embarked.

EAST GERMANY

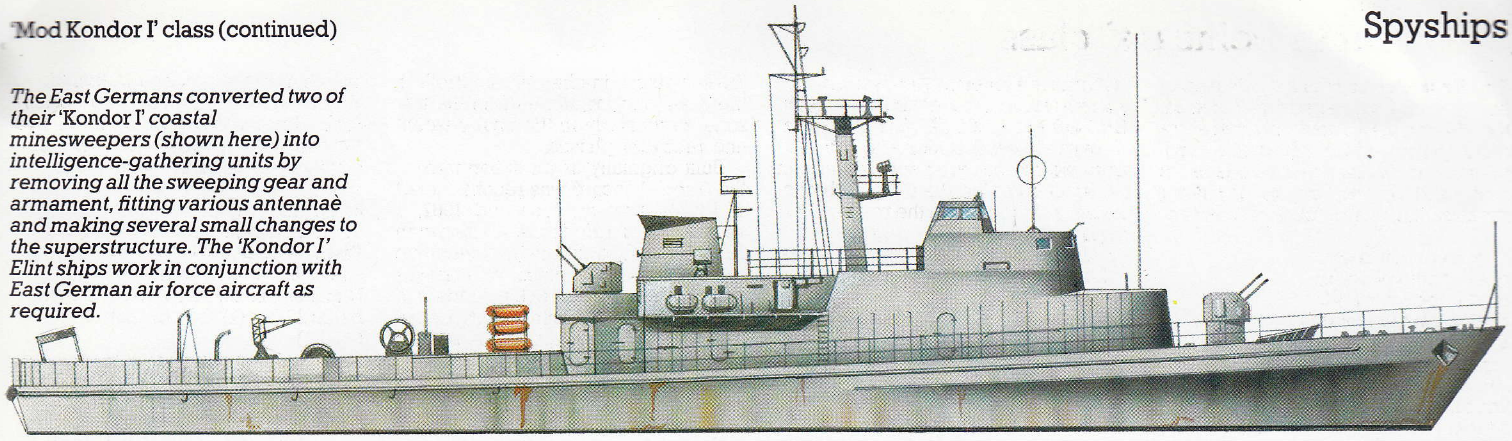
'Mod Kondor I' class

Two of a number of 'Kondor I' inshore minesweeper class conversions, the pair of **'Mod Kondor I' class** vessels produced between 1968 and 1970 are the ***Komet*** (D42) and ***Meteor*** (D43). These had their armament and minesweeping gear removed and various signal intelligence (Sigint) and electronic intelligence (Elint) antenna added, together with a deckhouse aft to accommodate the associated recording equipment. The vessels are used with a trawler-type unit, the *Hydrograph* (D41) of the Soviet 'Okean' design, to monitor NATO naval exercises in the Baltic, and regularly patrol offshore near highly sensitive West German and Danish military installations to gather classified signal data and electronic order-of-battle information. They have also been known on a number of occasions to appear near neutral Swedish installations and warships on similar missions. Very often the trips near NATO bases are co-ordinated with East German air force intelligence-gathering missions by Mikoyan-Gurevich MiG-21 'Fishbed-H' visual and electronic reconnaissance fighters and Ilyushin Il-14 'Crate' Elint platforms; these simulate penetration flight profiles into NATO airspace in order to trigger air-defence systems into revealing operating frequencies and procedures. The ships waiting offshore can thus record all the communications and signal traffic generated by the defending systems. The material gathered is then fed into the Soviet intelligence network for evaluation and comparison with existing data, and any deviations or new material are logged for future use in an all-out war.

Specification

'Mod Kondor I' class
Displacement: 245 tons standard and 320 tons full load
Dimensions: length 52.0 m (170.6 ft); beam 7.0 m (23.0 ft); draught 2.0 m (6.6 ft)
Propulsion: two diesels delivering 3729 kW (5,000 hp) to two shafts
Speed: 17 kts
Aircraft: none
Armament: SA-7 'Grail' SAMs, machine-guns and small arms
Electronics: one TSR333 navigation radar plus various unidentified Elint and Sigint systems
Complement: 40

'Mod Kondor I' class (continued)

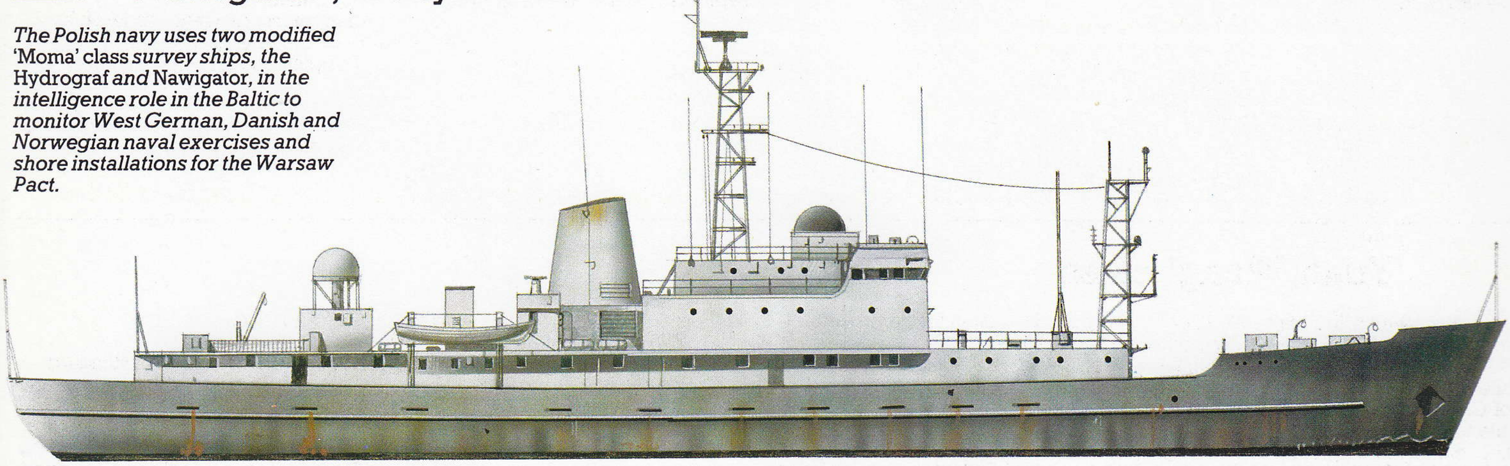


The East Germans converted two of their 'Kondor I' coastal minesweepers (shown here) into intelligence-gathering units by removing all the sweeping gear and armament, fitting various antennaè and making several small changes to the superstructure. The 'Kondor I' Elint ships work in conjunction with East German air force aircraft as required.

POLAND

'Nawigator', 'Baltyk' and 'Piast' classes

The Polish navy uses two modified 'Moma' class survey ships, the Hydrograf and Nawigator, in the intelligence role in the Baltic to monitor West German, Danish and Norwegian naval exercises and shore installations for the Warsaw Pact.

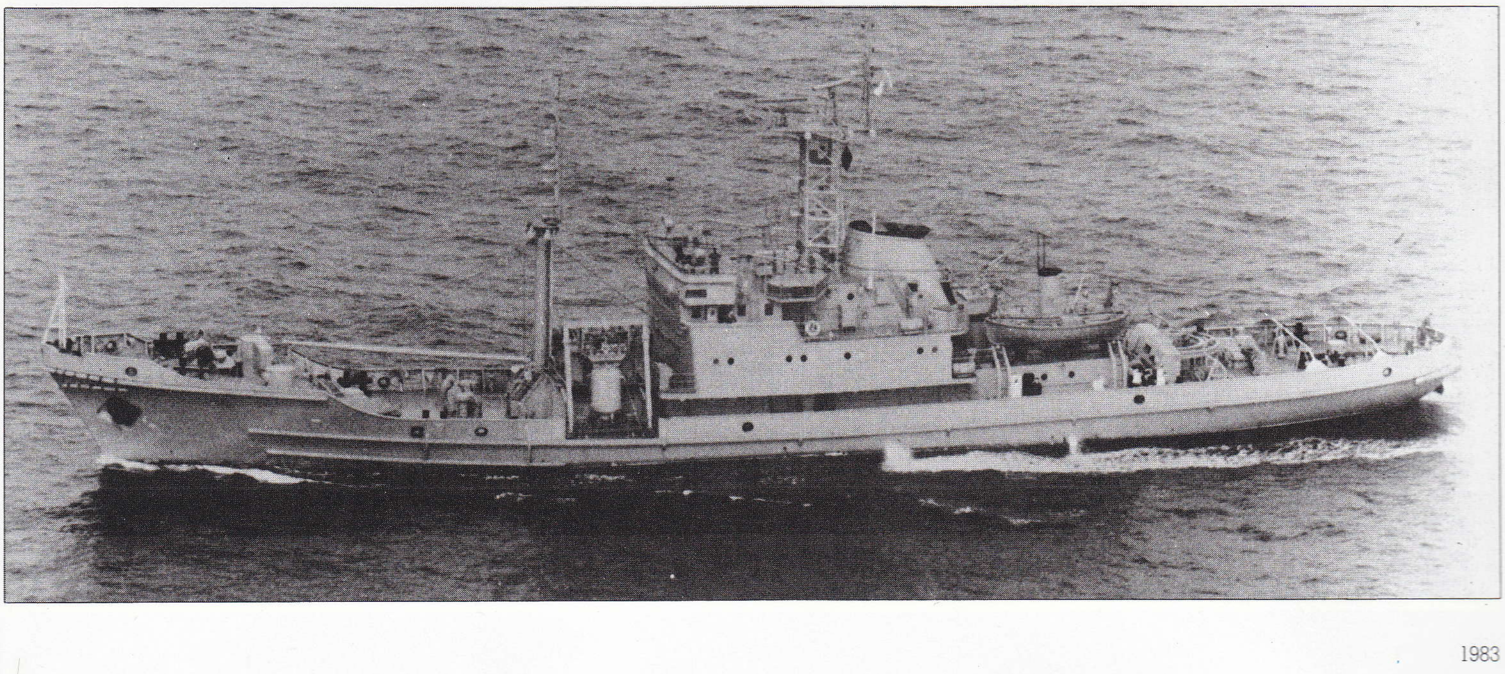


The two vessels that comprise the **'Nawigator'** class, namely the ***Nawigator*** (262) and ***Hydrograf*** (263), and the **'Piast'** class salvage vessels are all based on the Soviet-designed 'Moma' class survey ships. 'Nawigator' and 'Piast' class vessels mount a conspicuous lattice mainmast, the 'Nawigators' being distinguished by the addition of two large radomes, one immediately aft of the bridge atop the main superstructure and the other atop the aft superstructure. The *Hydrograf* differs slightly from her sister in having a much longer forecastle that is one deck higher. Although no armament is openly carried at present, there are positions for four twin 25-mm AA guns, two forward and two aft. Both the masts are fitted with a variety of DF and signal-intercept antennae, but it is believed that no real-time analysis capability is carried. Thus all the data obtained have to be recorded for eventual analysis at a shore station fitted with the necessary equipment and computer systems. All the information received after processing is then fed into the Soviet intelligence network for future use.

There is a third vessel, the 1,200-ton **'B10' class *Baltyk*** (264), a converted trawler which also serves in the AGI role with the Polish navy. Both the 'Nawigator' class units are quoted as navigational training ships, but like others are betrayed as to their real role by the enormous amount of electronic gear fitted.

Specification
'Nawigator' class

Displacement: 1,260 tons standard and 1,540 tons full load
Dimensions: length 67.0 m (219.8 ft); beam 10.5 m (34.4 ft); draught 4.0 m (13.1 ft)
Propulsion: two diesels delivering 2685 kW (3,600 hp) to two shafts
Speed: 17 kts
Aircraft: none
Armament: fitted for four twin 25-mm AA (not shipped), otherwise SA-7 'Grail' SAMs, machine-guns and small arms
Electronics: two RN231 navigation radars plus various unidentified Elint and Sigint systems
Complement: 60



Like the 'Nawigator' class of AGI, the 'Piast' class salvage vessel is based on the Soviet 'Moma' class survey ship. Note, however, the absence of radomes, the one lattice mast and the conspicuous diving bell together with its launching apparatus on the port side.

Watch Out-There's a Spy About

In spite of the much-vaunted abilities of modern satellite surveillance, the best method of obtaining information is actually by seeing something or by carrying out close-range eavesdropping. This is particularly true at sea, where every detail of NATO and US operational procedure is observed by a Soviet navy eager to bypass the long and tedious process of working it out for themselves.

It is a fact of military life that whenever NATO ships exercise at sea they are closely shadowed by ubiquitous Soviet 'spy' trawlers; small, rather friendly-looking ships, festooned with an array of antennae and direction-finding (DF) equipment. It is unlikely that the average person takes them seriously when they flash up on the TV screen during the evening news, for after all how can they possibly compare with the incredibly sophisticated electronic listening ships and submarines used by the Americans? In fact, they compare extremely well. Most of those chunky little trawlers have never been used for commercial fishing in their lives, and are potentially one of the most lethal weapons that the USSR has at its disposal. And there are literally hundreds of them in use by the USSR, together with their bigger sister ships, ranging from frigates converted to the electronic-intelligence (Elint) role to the 45,000-ton *Kosmonavt Yuriy Gagarin*. The Soviets have an ever-increasing appetite for information about the West, and their Elint-gathering ships provide almost more data than they can handle. Certainly these ships play a major role in the Soviets' search for military, economic and political intelligence: to understand why, we should take a brief look at the Soviet Union's geography.

Depending on one's viewpoint, the USSR is either an unfriendly nation surrounded by civilized countries, or the lone outpost of humanity continually threatened by warmongering capitalists on its very borders. The fact remains that it is considerably easier for the USA to run land-based listening stations close to the USSR than the reverse. It is also true that the USSR and its satellite countries are, by and large, geographically lumped together, whereas countries hostile to their dreams of world revolution are scattered throughout that same world. True, the Soviets try to maintain listening posts in client states like Vietnam, Angola and Cuba, but with very few exceptions they have discovered that all too often one revolution can be quickly followed by another, and that it is embarrassing, even dangerous, to be suddenly thrown out of an emerging nation. This problem has been highlighted tremendously over the past few years with the advent of the 'spy' satellite: the USSR simply does not have the land-based tracking and communications stations to remain in constant touch with its 'spies in the sky', as can the Americans.

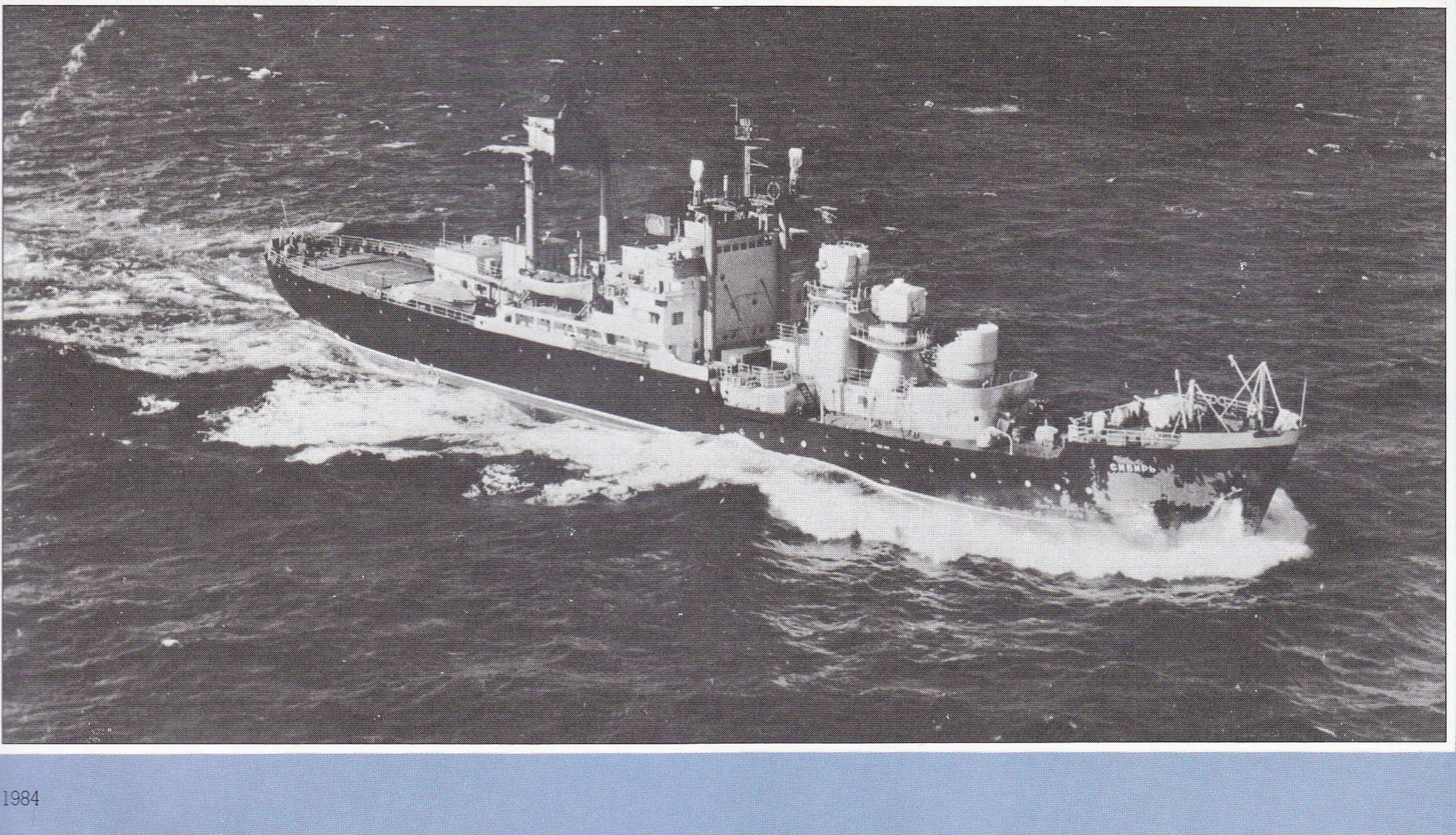
So, with typical logic, the USSR made the decision in the late 1950s to develop a sea-based Elint-gathering programme, which as much as anything else accounts for the continued rise of the Soviet navy.

Initially the USSR used converted trawlers: typically, the 'Okean' class of 720 tons with a crew of 32. These trawlers (or AGIs, Auxiliary Vessel Miscellaneous Type Intelligence to give them their NATO designation), were tasked with spying on NATO warships. Their mission went beyond discovering ship and weapon capabilities and tactics. They were responsible for finding out anything that would make the USSR more secure and the Soviet navy more effective. So they would observe how the British refuelled at sea or how the Americans handled night carrier landings in bad weather. But gradually, as the Elint process became more sophisticated, a new breed of ship with greater capabilities was demanded. The modern Soviet AGI is likely to be of the 'Balzam' class, of 4,000 tons and with a crew of 180. Not that the 'Okean' class AGI is no longer with us: there is one based permanently off the coast of Northern Ireland, where it monitors Royal Ulster Constabulary and British army radio transmissions. It can also monitor the Royal Artillery rocket range in the Outer Hebrides.

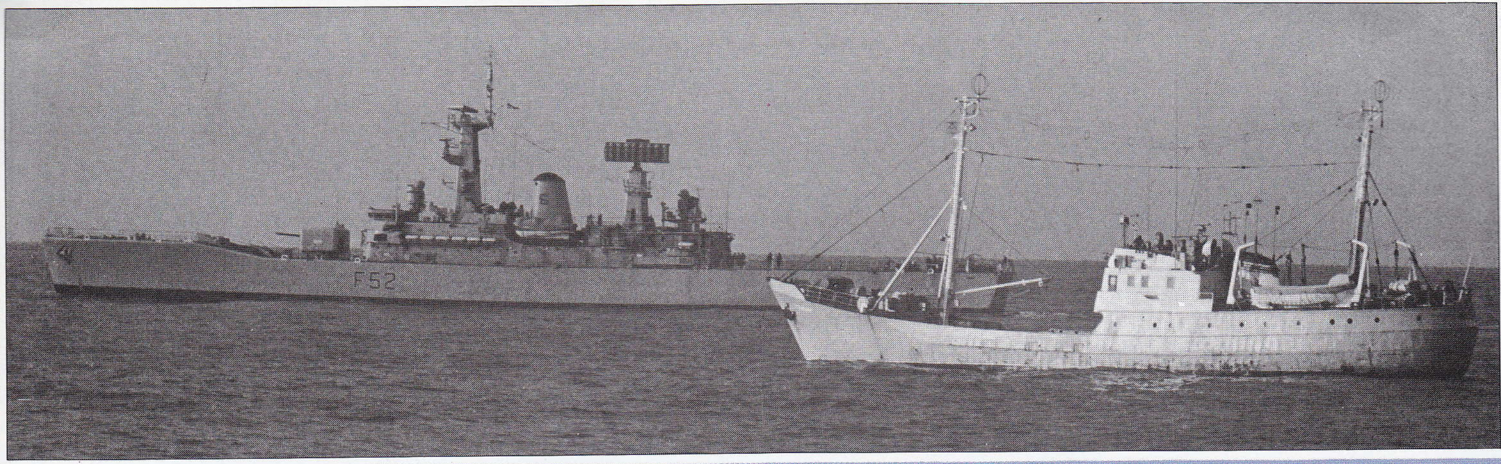
Main tasks

The main tasks of the Soviet AGIs (of all sizes) today can be said to be anti-submarine warfare (ASW); satellite communications (SATCOM), which may have an ASW role; military intelligence; and political and economic intelligence. ASW Elint is regarded as being particularly important because of the threat posed by NATO nuclear submarines, both those firing ballistic or cruise missiles and hunter/killers targeted against the Soviets' own nuclear submarines. To understand how these tasks are carried out, it is important to understand that modern Elint goes far beyond the simple interception of radio signals.

There are very few objects in the world that do not produce some form of recognizable electro-magnetic radiation. This radiation (not to be confused with nuclear radiation) is of



The naval missile range instrumentation ship* Sibir *monitors American missile tests south of the island of Midway in the Pacific. She normally embarks a Kamov Ka-25 'Hormone-C' utility helicopter on the aft flight deck, although no hangar facilities are fitted.



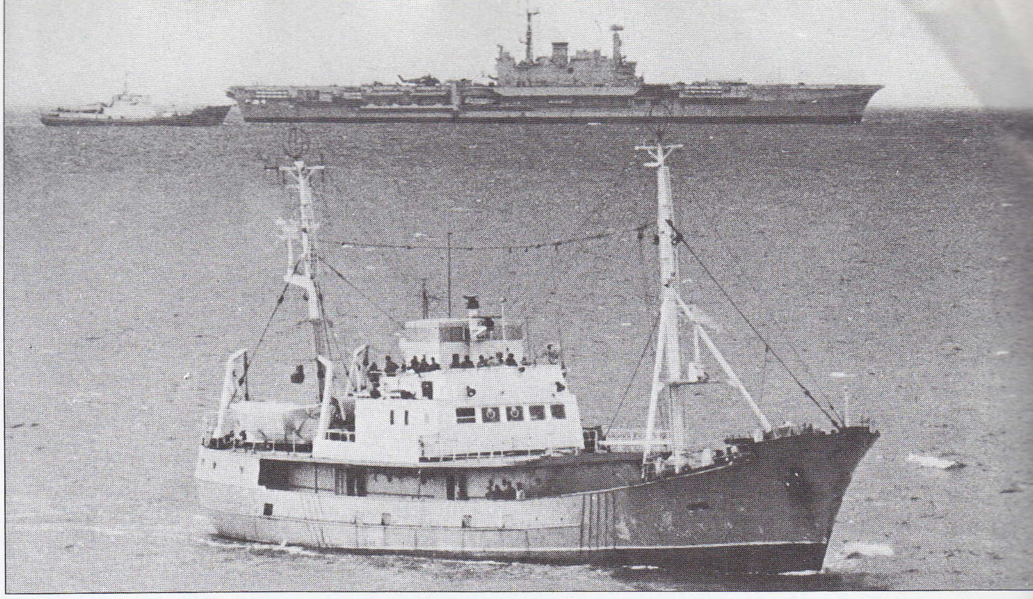
The AGI trawler Teodolit *shadows the 'Leander' class frigate HMS* Juno *in the North Sea during 1979. The AGI is trailing the frigate to record as many of its acoustic and electronic transmissions as possible, so as to build up an Elint profile for future use in a combat situation.*

three types: naturally occurring, artificially generated (e.g. radar) and the radiation emitted when an object is bombarded by or enters a field of another electro-magnetic force. In theory Mr Spock's sensor probes from the star ship *Enterprise* are possible, but in practice there are obvious problems: if the means of detection has to get so close to an object to identify it by means of electro-magnetic analysis that it could be recognized anyway, there is little point in mounting the exercise in the first place. Nonetheless, Elint techniques have advanced incredibly in the past decade, and although much of the work is highly classified a couple of examples should make the point. As noted above, nearly every object produces recognizable electro-magnetic radiation. But no two objects have identical radiation patterns. Transcribed to modern warfare (and remembering the more complex an object, the more recognizable the pattern), this means that both surface ships and submarines have their own 'electronic' signatures: a pattern of radiation that will identify the class, if not the individual ship itself. These signatures can be detected by various types of radar and by magnetic listening/detection devices, either floating on the surface or lurking on the ocean floor. They can also be in an aircraft or a satellite, but obviously the greater the distance, the greater the chance of an incorrect identification.

Similarly, a large metal object passing through the Earth's own magnetic field will produce a recognizable pattern of interference in exactly the same way that a ship is followed by its wake, or a thrown stone causes ripples in a pond.

Again, infra-red radiation can lead to the detection and identification of aircraft, ground troops, surface ships and submarines; ships in particular leave an infra-red 'shadow' behind them. In fact, this type of infra-red surveillance is carried out by satellite or aircraft; if the satel-

Soviet intelligence gatherers have in the past been converted from, or based upon, deep sea trawler designs. Such vessels are not particularly comfortable to crew, but have the endurance and seaworthiness to trail naval units through all but the very worst weather.



NATO carrier activity over the years has always attracted Soviet AGIs, as this 1974 exercise with HMS Hermes *and her attendant* Mayak *(foreground) and* Moma *(background) shows. It is painstaking recording on film of aircraft activity aboard carriers that has helped the Soviets to construct their new nuclear-powered 'Kremlin' class carrier.*

lite in question is too far from a Soviet-based land station, it will transmit its information via an AGI, as will a spy plane. The AGI will send on the information received by retransmitting it to another satellite nearer the Soviet Union, or by beaming it to an overflying aircraft like the Tupolev Tu-95 'Bear-D'. Latterly, though, the Soviets have shown a distinct preference for using satellite links.

Satellite launch

The USSR has also mastered the art of launching surveillance satellites to cover specific events. For example, shortly after the start of the Falklands war in 1982 a satellite was launched and placed in orbit over the islands. It is hardly likely that any information was passed to either the British or the Argentines; this launch (in May 1982) was purely to gain information about British offensive capabilities and Argentine weapon systems.

Similarly, a Soviet satellite was launched shortly after the outbreak of the Iran-Iraq war. Its infra-red sensing ability helped pinpoint Iraqi troop positions, information that was passed onto the Iranians with initial devastating effect. Shortly after that the Iranians moved against the Tudeh (the pro-Soviet Iranian Communist party), and the flow of information from Moscow ceased.

AGIs undoubtedly provide the backbone of the Soviet Elint-gathering process. As has been seen, the modern AGI is considerably larger and (presumably) more comfortable than its rugged little predecessor, and also considerably more versatile. The deployment and tasking of AGIs is tightly controlled: they are not simply let loose on the world's oceans to gather whatever Elint they can find, but rather are directed at specific targets, be it Holy Loch (which will probably mean an AGI on more or less permanent station) or a test firing of the latest submarine-launched ballistic missile (as was undertaken by the oceanographic research ship *Khariton Laptev* off Florida on 31 July 1970). Their presence cannot simply be ignored; a Poseidon test firing was delayed for several days in 1982 for an AGI that would not go away.

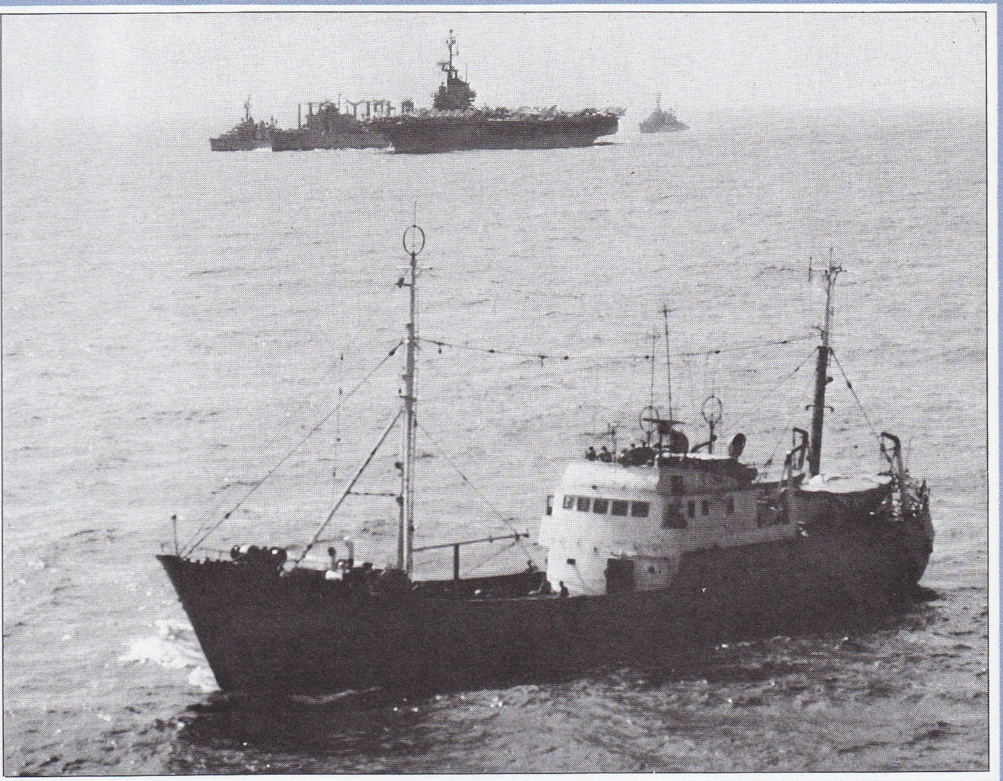
It is extremely common for the same AGI to appear with a totally different antenna array than when previously sighted, since the Soviet technique is to adapt the AGI to the specific task.

Other navies

Of course, the USA possessed the most famous AGI of all time in the USS *Pueblo*, seized by the North Koreans on 23 January 1968 and whose crew was not released for a further 11 months. About seven months previously, the telecommunications research ship *Liberty* was badly damaged by the Israelis while monitoring the Six Day War. These experiences turned the US Navy away from AGIs, with the result that today the Americans rely far more heavily on satellites and land-based listening stations; American satellites are far more effective than their Soviet counterparts, and as a result fewer are required to provide coverage of areas of particular interest. Any US Navy AGIs that do exist are likely to be standard warships converted to an AGI role but maintaining their armament.

The British Admiralty is more close-mouthed about its operations than any other branch of the armed forces, so very little is known about British AGIs. There have been rumours for some time about British commercial trawlers being temporarily adapted for the AGI role. When the Hull trawler *Gaul*, 1,106 tons, disappeared off the north coast of Norway (no survivors from her 36-man crew, no wreckage and not even a solitary life belt to mourn her passing), the rumours that swept her home port suggested that she had been used for Elint-gathering and had been carrying Royal Naval personnel at the time of her disappearance. Whatever the truth of the matter (and Thames Television did take it seriously enough to transmit an hour-long documentary on the subject a year later, in 1974), it can be said that the British government would have to have a very good reason not to take advantage on occasions of the opportunity presented by innocuous, legitimate trawlers sailing close to the Soviet coast. And for that matter, no one really knows how many Soviet AGIs have suddenly and mysteriously disappeared, victims of a freak wave, a giant octopus, or simply by being in the wrong place at the wrong time! In the field of electronic warfare genuine accidents do happen, as witness the case of the American submarine that actually managed to scrape the bottom of a Soviet submarine while monitoring a Soviet fleet exercise.

People tend to forget that while few shots are ever fired, today's electronic warfare is as vital as any major battle in the last war. That stubby little 'Okean' class AGI may look harmless (perhaps even slightly comic with its bewildering array of antennae), but it is part of a weapons system that is potentially as lethal as any nuclear missile.



The 'Okean' class intelligence trawler Gidrofon *shadows the US carrier* Coral Sea *in the Gulf of Tonkin during 1969. The role of the AGI here was to follow and report whenever a carrier launched a strike into North Vietnam or Laos so as to give the air defences plenty of time to warm up their radars and SAMs.*

USSR

'Okean' class

Built in East Germany from 1959 to the mid-1960s, the **'Okean' class** of 15 converted side trawlers is the largest and hence the most observed class of Soviet AGI. They are designated *gigrograficheskoye sudno* (GS, or survey ship) in the Soviet navy, and retain their trawler tripod mast forward and a pole mast well aft. These are festooned with the various aerials and antennae that characterize their role. It is vessels of this class (together with the eight larger trawler units of the 'Mayak' class and the four ex-whalers of the 'Mirnyy' class) that are regularly seen off the Western nuclear submarine bases monitoring the coming and going of SSBNs in transit. There are many variations within the class. One modified subgroup of four (the ***Linza, Lotlin, Reduktor*** and ***Zond***) has the port side superstructure enclosed and the starboard side open; these ships also have additional accommodation on the welldeck. The *Reduktor*, ***Alidada, Barometr, Ampermetr*** and ***Gidrofon*** have no installation for shoulder-launched SA-7 SAMs, while such has been added to the ***Barograf, Deflektor, Ekholot, Krenometr,*** *Linza, Lotlin,* ***Repiter, Teodolit, Traverz*** and *Zond*. The *Barograf* also has two twin 14.5-mm (0.57-in) heavy machine-gun mountings to supplement the small arms carried by the crew. It is likely that the 'Okean' class will eventually be replaced by conversions of the **'Al'pinist' class** stern trawlers which are currently being built at the Leninskaya Kuznitsa Shipyard at Kiev and at the Volgograd Shipyard. At present there are five such units in service, with the former fish hold converted to allow extensive space for electronics and/or additional accommodation for specialist personnel.

Specification

'Okean' class

Displacement: 650 tons standard and 760 tons full load

Dimensions: length 51.0 m (167.3 ft); beam 8.8 m (28.9 ft); draught 3.7 m (12.1 ft)

Propulsion: one diesel delivering 403 kW (540 hp) to one shaft

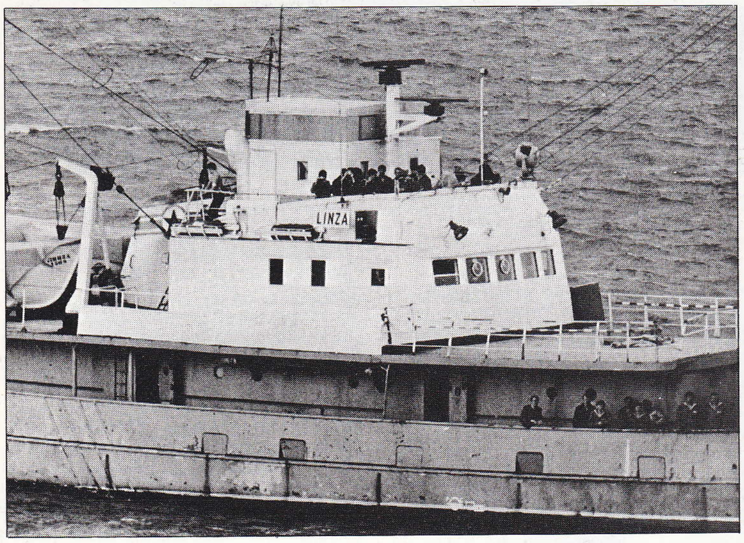
Speed: 13 kts

Aircraft: none

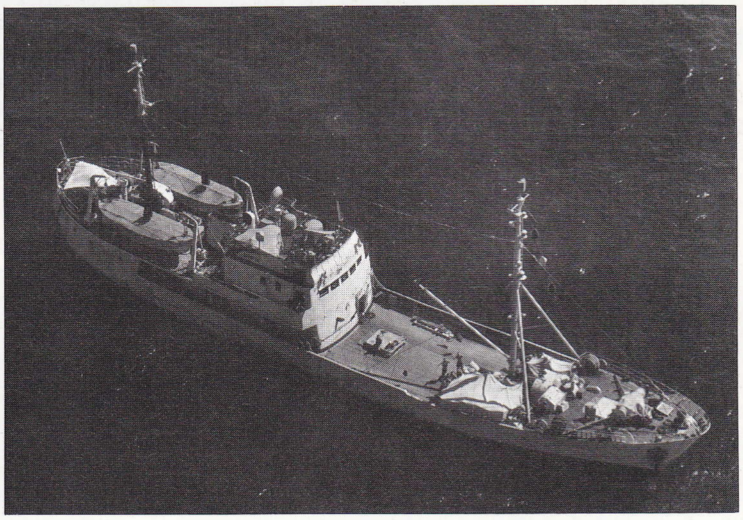
Armament: see text

Electronics: one or two 'Don Kay' navigation radars, and various Elint and Sigint systems

Complement: 70



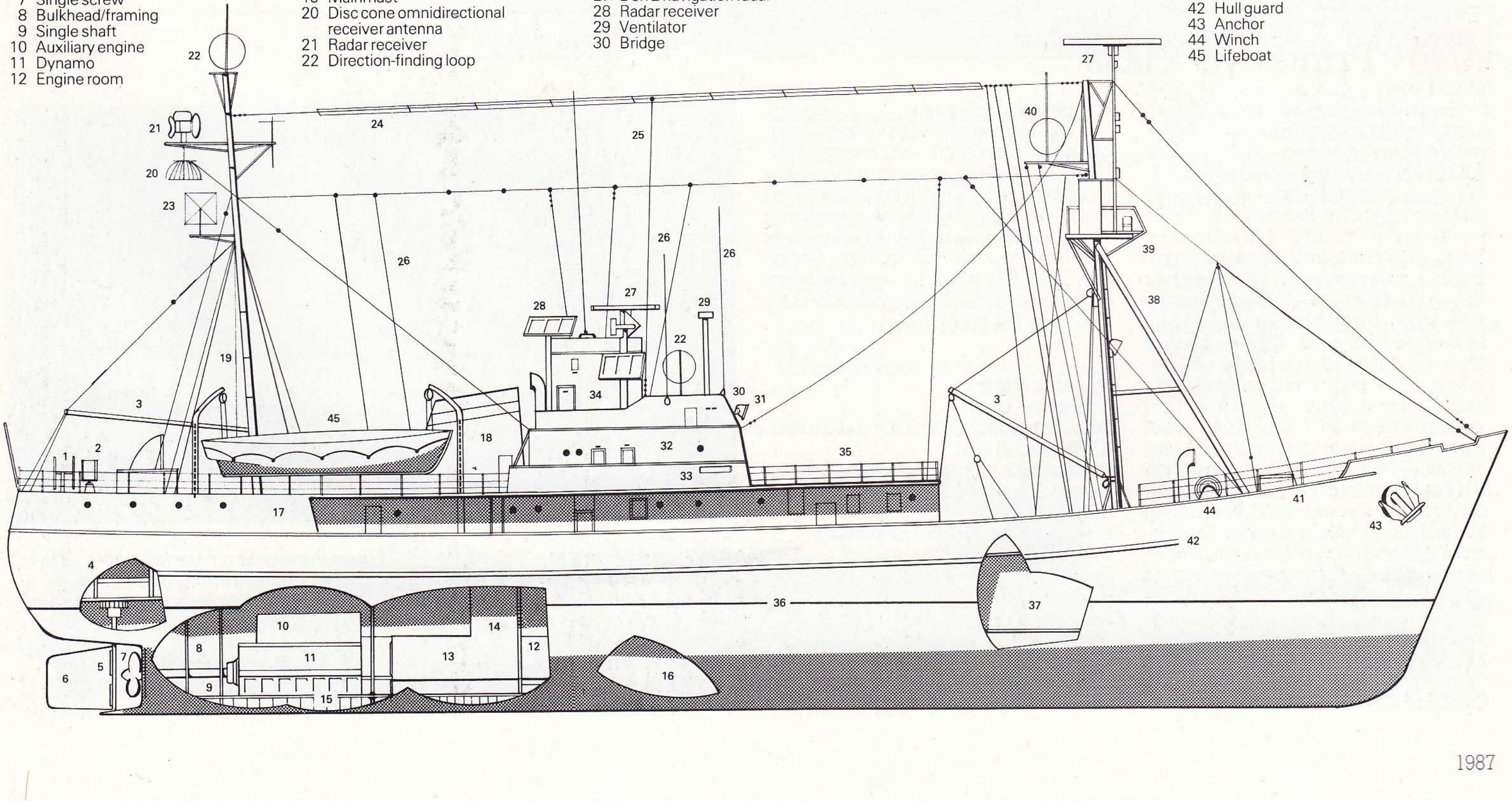
The Linza *of the 'Okean' class shadows the amphibious warfare ship HMS* Fearless. *The 'Okeans' are the most numerous of the Soviet AGIs, with the antenna outfits varying considerably between the units of the class so that they can perform different roles.*



The 'Okean' class AGI Gidrofon. *Most of the class have now been fitted with two positions for quadruple SA-N-5 'Grail' SAM launchers. The* Barograf *has also been fitted with two twin 14.5-mm heavy machine-guns for use off such unfriendly areas such as the African coast and China.*

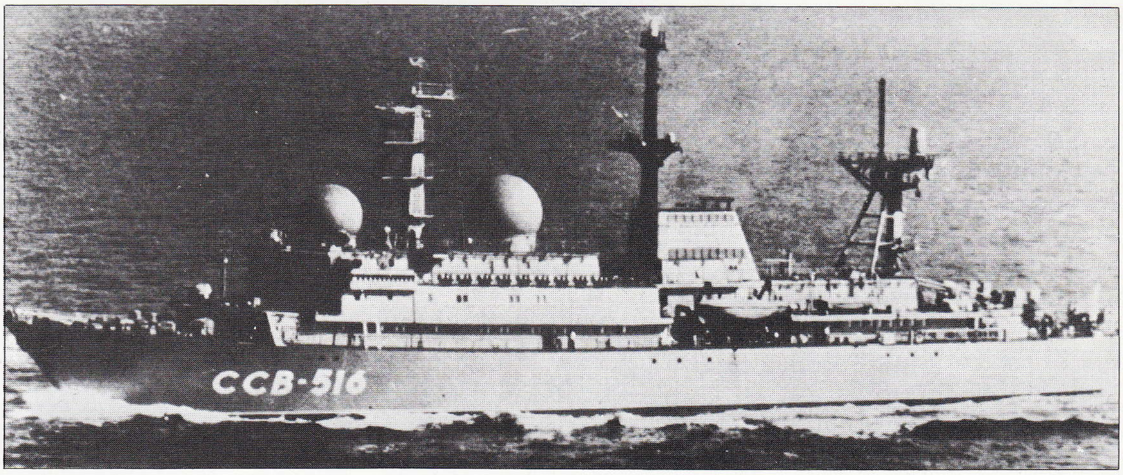
'Okean' class intelligence collection ships cutaway drawing key

1 Aft wheel
2 Searchlight
3 Derrick
4 Steering compartment
5 Rudder post
6 Rudder
7 Single screw
8 Bulkhead/framing
9 Single shaft
10 Auxiliary engine
11 Dynamo
12 Engine room
13 540-bhp diesel engine
14 Exhaust uptake
15 Double bottom
16 Fuel
17 Officers'/crew quarters
18 Funnel
19 Mainmast
20 Disc cone omnidirectional receiver antenna
21 Radar receiver
22 Direction-finding loop
23 Air search
24 Folded dipole for HF reception
25 Coaxial feeder to wire dipole antenna
26 Vertical rod antenna
27 Don 2 navigation radar
28 Radar receiver
29 Ventilator
30 Bridge
31 Deck light
32 Chart room
33 Navigation light
34 Radar room
35 Extended space for information processing
36 Waterline
37 Forward hold
38 Tripod foremast
39 Bow light
40 Direction-finding loop with earthplane
41 Raised foredeck
42 Hull guard
43 Anchor
44 Winch
45 Lifeboat



USSR

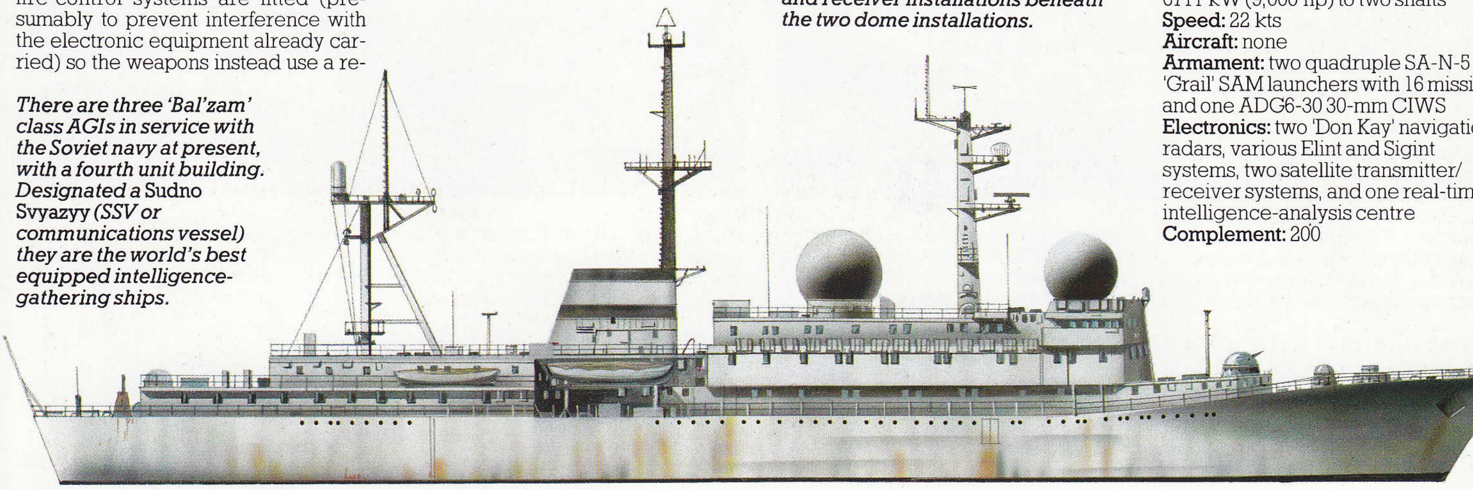
'Bal'zam' class



Designated by the Soviets as *sudno svyazyy* (SSV, or communications vessels) the **'Bal'zam'** class vessels are the first military ships purpose-built for intelligence collection and processing. Three are currently in service, with a fourth due to join the fleet in 1986 following completion at the Kaliningrad Shipyard. The ships carry an array of intercept and direction-finding antennae that feed raw intelligence information into the onboard data analysis and processing equipment located within the extensive superstructure. The product can then be sent via the two satellite transmitting and receiving antennae located beneath the spherical radomes, either to shore stations or to the flagships of surface action battle groups for immediate action. For the extended sea periods which they serve, the ships are equipped to refuel underway and to transfer solid cargo and personnel via constant-tension transfer rigs on each side of the aft mast. The class was also the first Soviet AGI type to be defensively armed, the lead ship appearing in service during 1980 with two quadruple SA-N-5 'Grail' SAM launchers and a 30-mm six-barrel ADG6-30 CIWS. However, no radar fire-control systems are fitted (presumably to prevent interference with the electronic equipment already carried) so the weapons instead use a remote 'Kolonka' pedestal director. The 'Bal'zams' are now commonly seen at sea monitoring major NATO naval exercises in the North Atlantic, and also American carrier battle groups. Surprisingly, the class is one of the few modern ship designs fitted with major masts.

SSV 516 is the lead ship of a new class of very large AGIs given the NATO codename 'Bal'zam'. Armed with two quadruple SA-N-5 'Grail' SAM launchers and a 30-mm CIWS, the class also has elaborate at-sea underway replenishment facilities and real-time satellite transmitter and receiver installations beneath the two dome installations.

Specification
'Bal'zam' class
Displacement: 4,000 tons standard and 5,000 tons full load
Dimensions: length 105.0 m (344.5 ft); beam 15.5 m (50.9 ft); draught 5.0 m (16.4 ft)
Propulsion: two diesels delivering 6711 kW (9,000 hp) to two shafts
Speed: 22 kts
Aircraft: none
Armament: two quadruple SA-N-5 'Grail' SAM launchers with 16 missiles, and one ADG6-30 30-mm CIWS
Electronics: two 'Don Kay' navigation radars, various Elint and Sigint systems, two satellite transmitter/receiver systems, and one real-time intelligence-analysis centre
Complement: 200



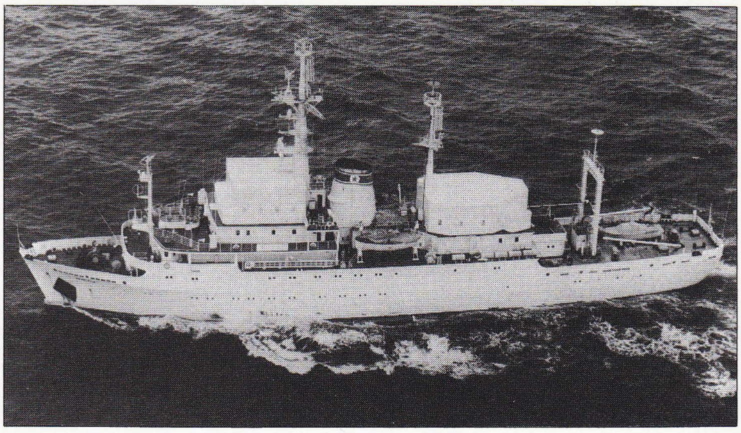
There are three 'Bal'zam' class AGIs in service with the Soviet navy at present, with a fourth unit building. Designated a **Sudno** ***Svyazyy (SSV or communications vessel) they are the world's best equipped intelligence-gathering ships.***

USSR

'Primor'ye' class

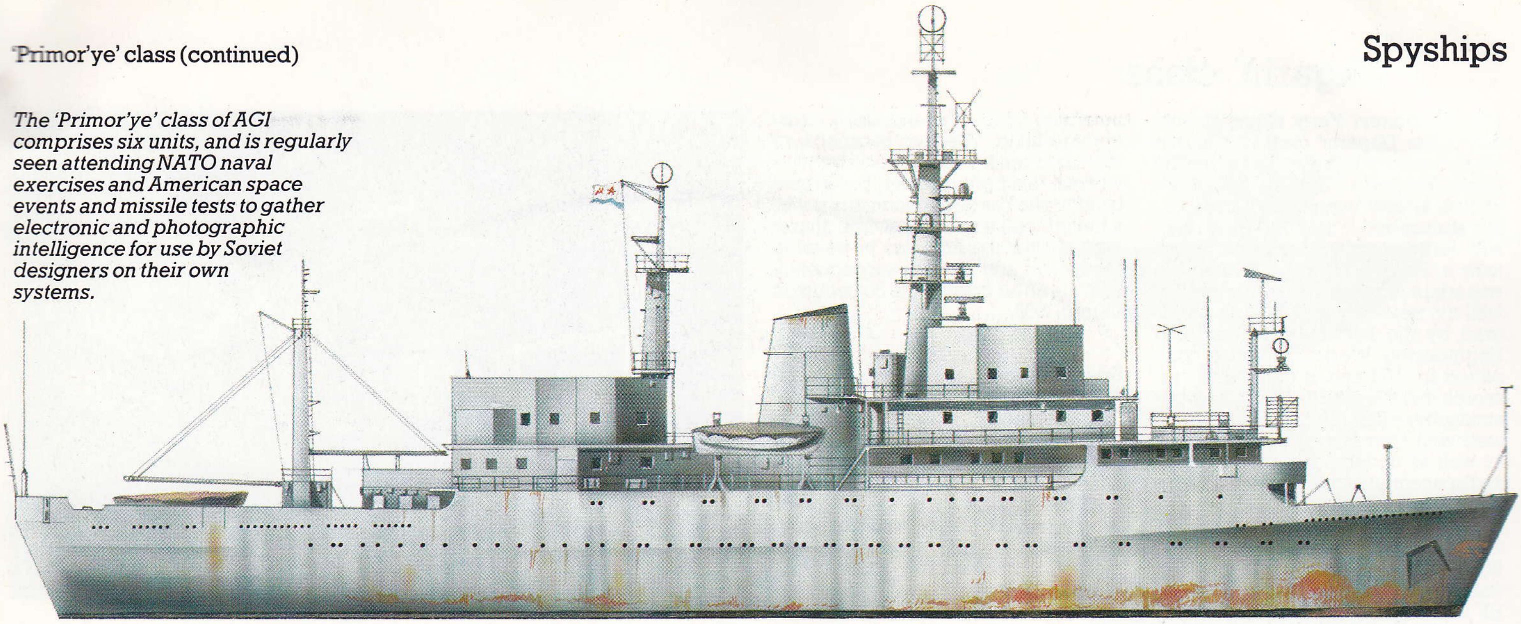
Although its units resemble small passenger liners in appearance, the **'Primor'ye' class** of AGI was the first commercially-based intelligence-gathering design to have an onboard analysis capability. Based on the hull of the highly successful 'Mayakovskyy' series of stern trawler-factory ships, the six vessels are the ***Kavkaz*** (SSV591), ***Krym*** (SSV590), ***Primor'ye*** (SSV465), ***Zabaykalye*** (SSV464), ***Zakarpatye*** and ***Zaporozhye*** (SSV501). They have a distinctive superstructure with box-like structures fore and aft (to house electronic processing equipment) and three main masts (for the associated aerials and antennae). Two of the units, the *Krym* and *Kavkaz*, retain the trawler kingpost aft, while all six vessels differ among themselves in minor details of superstructure and antennae outfits. Most have now been refitted with platforms to carry one or two quadruple SA-N-5 'Grail' SAM launchers for local air defence, while as an interim measure they previously carried the Soviet army's shoulder-launched SAM-7 'Grail' SAM that had been issued to the Soviet naval infantry.

The 'Primor'ye' class ships have often been seen off both coasts of the USA, especially during the missile tests held off Florida by British and American SSBNs. They also regularly accompany major NATO exercises and American aircraft-carriers, but do not have the modern real-time data transmission facilities possessed by the later 'Bal'zam' class.



The Zakarpatye of the 'Primor'ye' class shows the multitude of arrays and antenna that are required by an intelligence-gathering ship. Those on the foremast are primarily of the direction-finding type so as to pinpoint the origin of an electronic transmission.

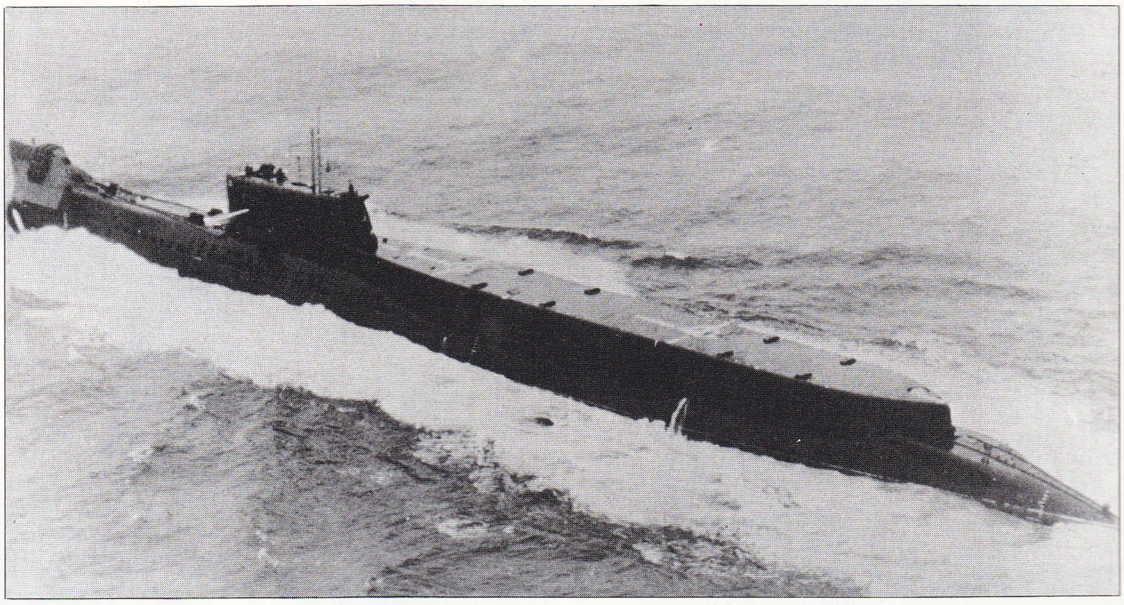
Specification
'Primor'ye' class
Displacement: 2,600 tons standard and 3,700 tons full load
Dimensions: length 83.6 m (274.3 ft); beam 13.7 m (44.9 ft); draught 7.0 m (23.0 ft)
Propulsion: one diesel delivering 1491 kW (2,000 hp) to one shaft
Speed: 13 kts
Aircraft: none
Armament: one (SSV 590) or two (SSVs 464, 501 and 591) quadruple SA-N-5 'Grail' SAM launchers with eight or 16 missiles respectively (other ships to be fitted with launchers), machine-guns and small arms
Electronics: two 'Don Kay' or 'Don 2' navigation radars, various Elint and Sigint systems, and one real-time intelligence-analysis centre
Complement: 160



The 'Primor'ye' class of AGI comprises six units, and is regularly seen attending NATO naval exercises and American space events and missile tests to gather electronic and photographic intelligence for use by Soviet designers on their own systems.

USSR

'India' class



Photographed in transit from the Pacific to the Northern Fleet, this 'India' class boat has landed both DSRVs and has been fitted with a built-up bow to cope with the rough conditions of the northern coast.

Although said to be designed for the underwater-rescue role, with two small deep submergence recovery vessels (DSRVs) semi-recessed in wells on the deck abaft the sail structure, the two units of the **'India' class** diesel-electric submarine would in wartime or for certain clandestine intelligence-gathering operations probably operate with the Soviet navy's Spetsnaz special forces brigades to carry combat mini-subs and frogman units. The DSRVs normally carried are about 11 m (36.1 ft) long and are fitted out to lock onto the rescue hatches of submarines lying disabled on the seabed. For under-ice and covert operations direct access to and exit from the DRSVs in their wells is possible while the submarine is submerged. Although no torpedo armament is believed to be carried, the hull of the submarine has been designed for high surface speed operation in order to cut down on transit times to possible rescue areas. For operations in the extreme north, where ice-floes are likely to be encountered, the bow can be specially strengthened by the fitting of an ice guard. For convenience (and better underwater manoeuvring in certain circumstances) the hydroplanes are fitted on the sides of the sail.

Only two 'India' class boats are in service, one with the Northern Fleet and the other with the Pacific Fleet. The former may have been detached to the Baltic Fleet on occasions for use in the various incursions that have been made into Swedish territorial waters over the past few years. It is believed that on this type of operation the 'India' class submarine carries two modified versions of the Soviet army's new IPR tracked amphibious armoured engineer vehicle with diver lock-out facilities; this vehicle is capable of travelling along the seabed on tracks as well as using the more conventional swimming mode. It is possible that a further pair of more modern SSAGs (rescue submarines) has either been built or is in the final stages of construction. These will supplement and not replace the 'India' class units.

Specification

'India' class

Displacement: 3,900 tons surfaced and 4,800 tons dived

Dimensions: length 106.0 m (347.8 ft); beam 10.0 m (32.8 ft); draught not known

Propulsion: three diesels delivering 8948 kW (12,000 hp) to two electric motors powering two shafts

Speed: 15 kts surfaced and 12.5 kts dived

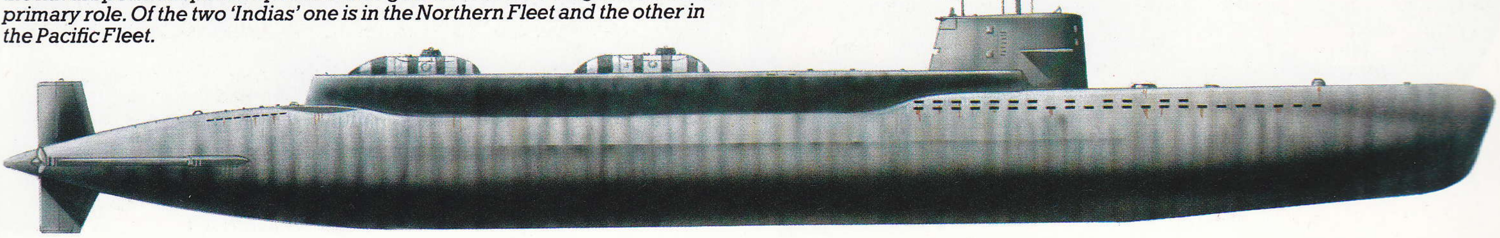
Diving depth: mother craft 300 m (984 ft) operational and 500 m (1,640 ft) maximum; DSRVs 1000 m (3,281 ft) operational

Armament: demolition charges, small arms etc

Electronics: one 'Snoop Plate' surface-search radar, one ESM system, one medium-frequency bow sonar, several types of underwater telephone and homing systems

Complement: 70 crew plus 120 passengers/divers

The 'India' class rescue submarines are equipped to carry and operate two deep submergence rescue vessels, and are believed to operate in support of the naval Spetsnaz special operations brigades when not being used in their primary role. Of the two 'Indias' one is in the Northern Fleet and the other in the Pacific Fleet.



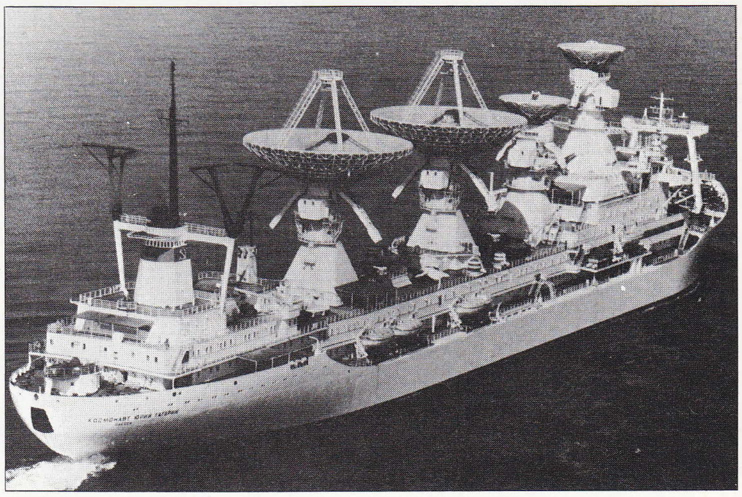
USSR

'Gagarin' class

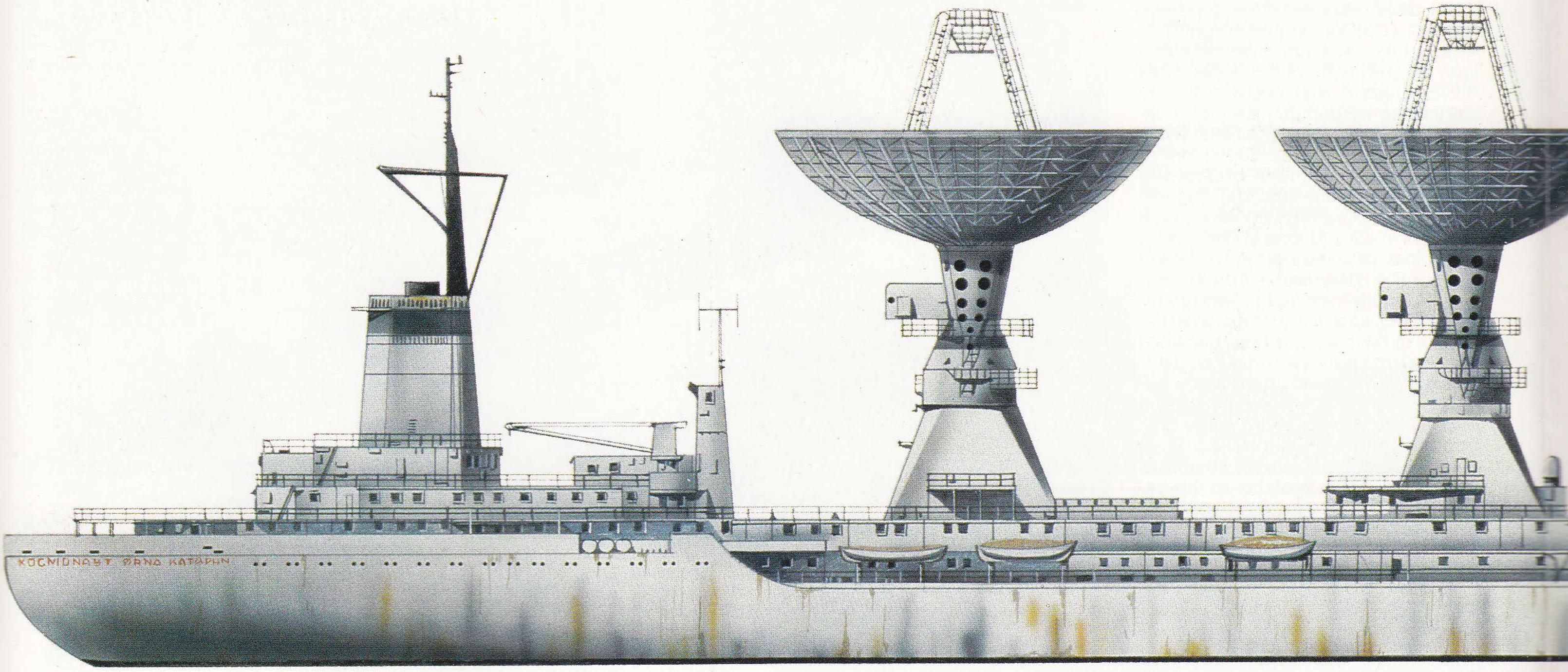
The ***Kosmonavt Yuriy Gagarin***, sole unit of the **'Gagarin' class**, is a space control monitoring ship based at the Black Sea port of Odessa. She is the world's largest vessel fitted for scientific studies and is also the largest ship with turbo-electric propulsion. Originally a 'Sofiya' class steam tanker, she was adapted before final completion to fulfil the research role. Built at Leningrad by the Baltic Shipbuilding and Engineering Works, she was completed in 1971 and is engaged in research into the conditions in the upper atmosphere and the problems associated with long-range communication, as well as undertaking space control and spacecraft communications activities. For this work the ship is fitted with two 27-m (88.6-ft) diameter 'Ship Shell' and two 12.5-m (41-ft) diameter 'Ship Bowl' stabilized communications and tracking dish antennae, two 'Vee Tube' HF communications systems and four 'Quad Ring' yagi arrays. With all the antennae deployed forward, the vessel suffers a loss in speed of 2 kts. To maintain the ship on station during a particular task, bow and stern thrusters are fitted. The ship is capable of staying at sea for 120 consecutive days without resupply, and for her crew's comfort she has three swimming pools, a theatre and a sports hall. The ship is named after the first man to travel in Earth orbit, and who was subsequently killed in an air crash in the Soviet Union during 1968.

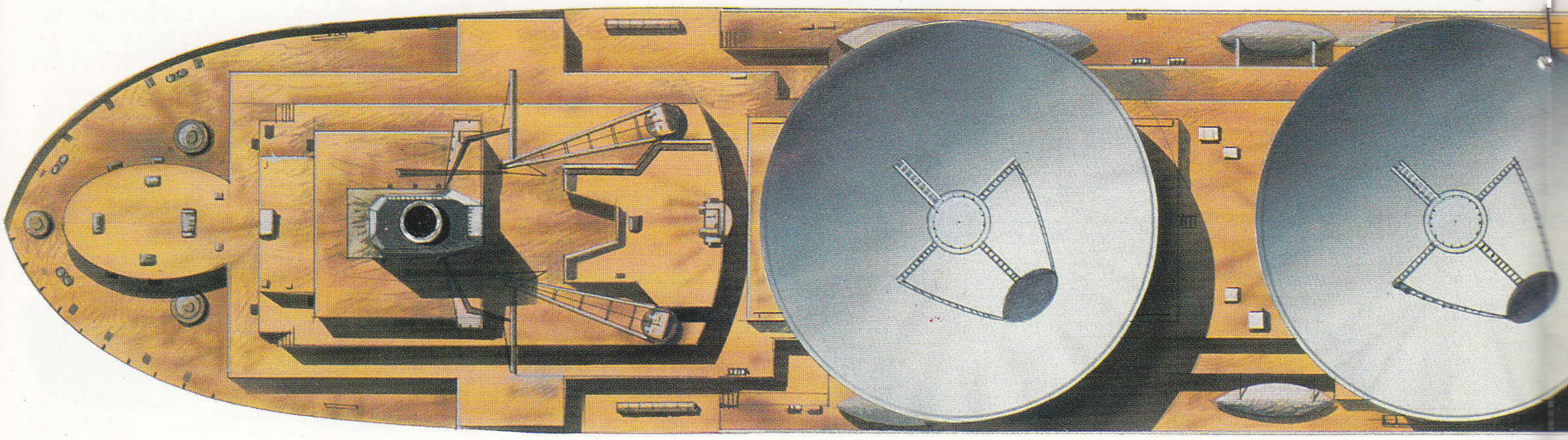
Specification

'Gagarin' class
Displacement: 37,500 tons standard and 45,000 tons full load
Dimensions: length 235.9 m (774.0 ft); beam 31.0 m (101.7 ft); draught 9.2 m (30.2 ft)
Propulsion: one geared steam turbine delivering 14168 kW (19,000 hp) to an electric drive turning one shaft
Speed: 17.5 kts
Aircraft: none
Armament: none
Electronics: two 'Don Kay' navigation radars plus items mentioned in the text
Complement: 320



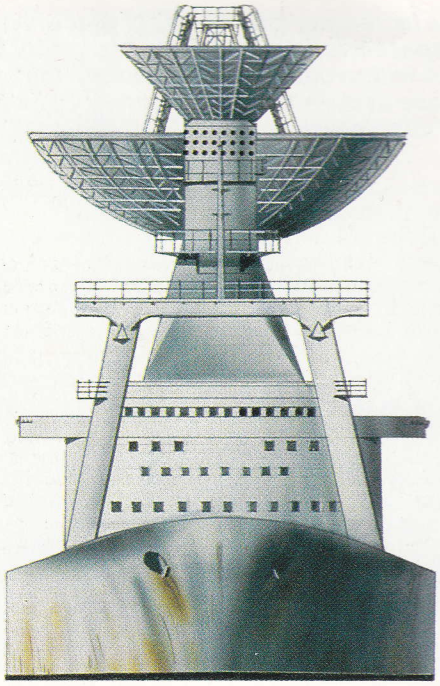
The 45,000-ton Kosmonavt Yuriy Gagarin *is the largest Soviet research vessel, adapted from the unfinished hull of a tanker. Her powerful communication and detection equipment enable Soviet space missions to be controlled far from convenient ground stations.*

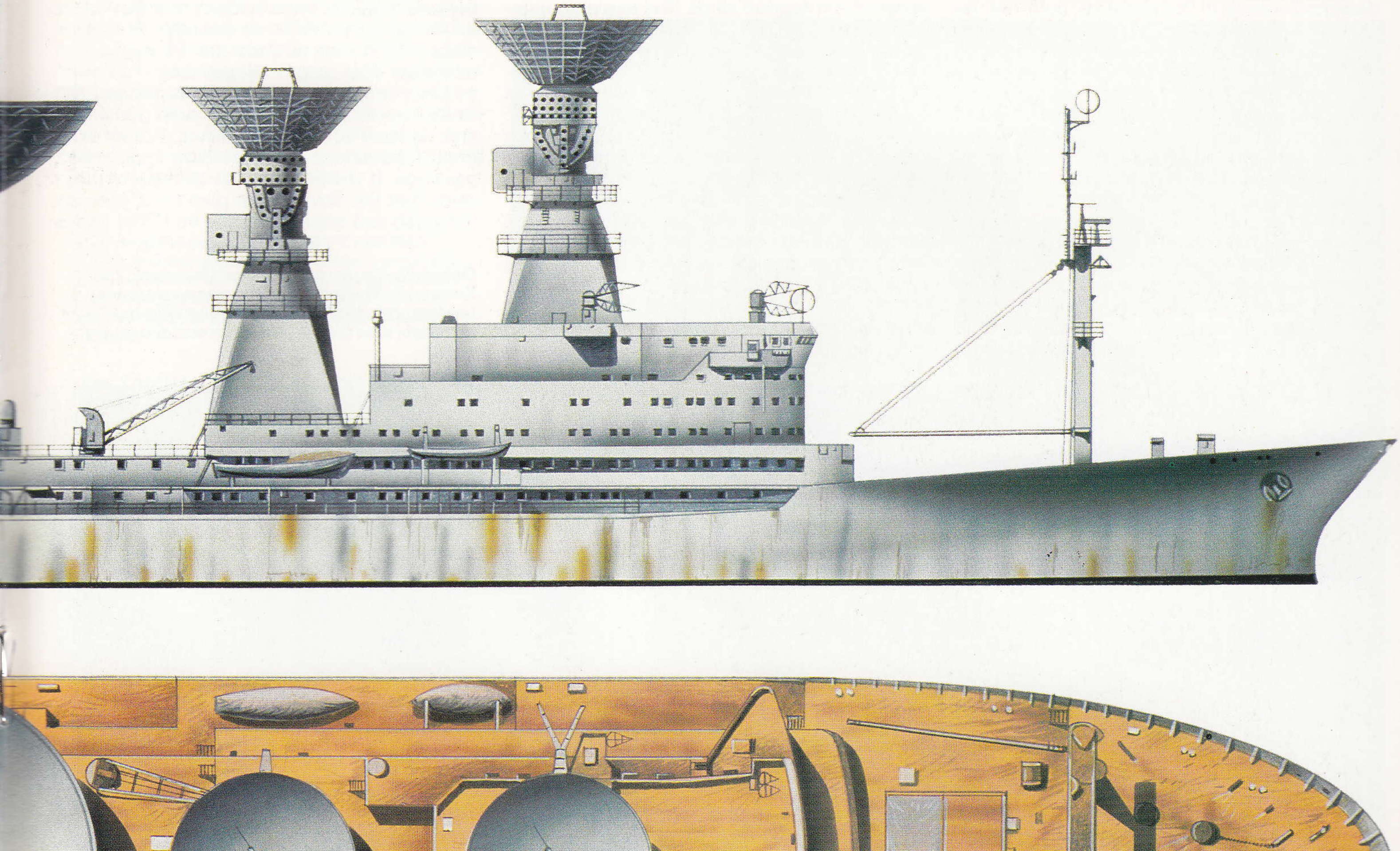


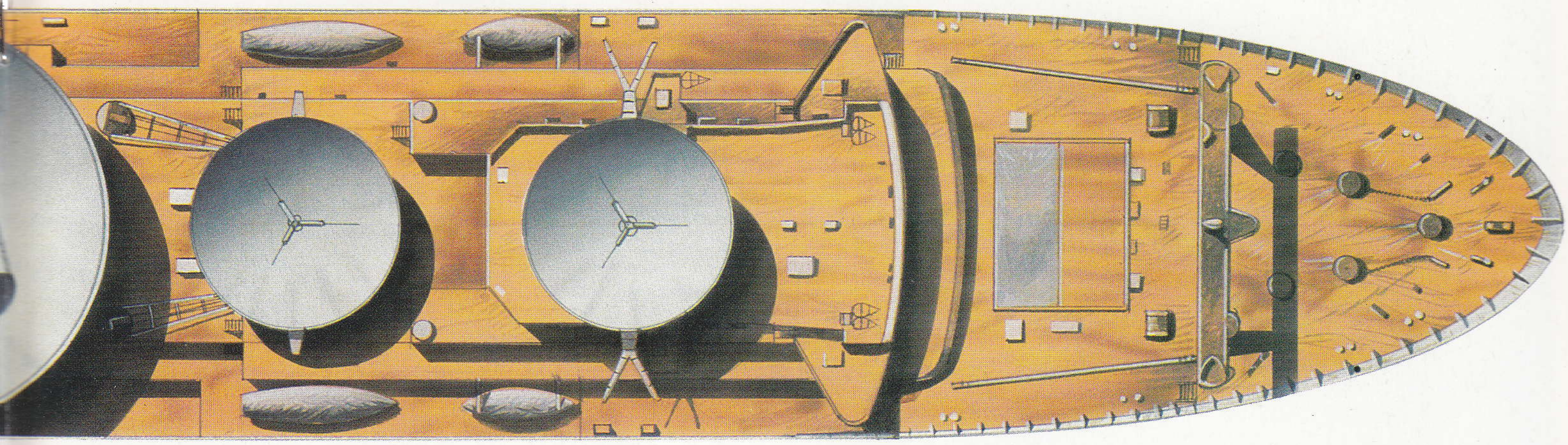


Kosmonavt Yuriy Gagarin

The Kosmonavt Yuriy Gagarin *is the largest of the Soviet space event ships and is subordinated to the Academy of Science for assignments. Adapted from a tanker hull whilst still on the stocks, she is homeported at Odessa in the Black Sea but operates in many parts of the world. The four huge dish antennae can act as brakes, and when in the correct orientation actually reduce the speed of the ship by up to two knots. For the crew's comfort on long voyages she has three swimming pools, a gymnasium and a 300-seat theatre aboard.*







Soviet Space Tracking Ships

The increasing military use of space has seen the necessity for the accurate control of space missions and the tracking of ICBM and SLBM tests. Less favoured than the USA with ground station locations, the Soviets have developed a series of large space-associated vessels, some of which have the purely military task of monitoring US missile tests.

The Soviet space tracking ships are nominally civilian-manned and subordinated to the Academy of Sciences. Their role is primarily to provide communications relay services to manned spaceflights and space stations, and to conduct basic research into the upper atmosphere and the effect it has on long- and short-range communications systems. Apart from the civilian fleet, the Soviet navy also contributes the eight naval-manned 'Vytegrales' class cargo ships, several 'Moma' and 'Samara' class survey and buoy-tender ships, and the six dedicated missile range instrumentation vessels of the 'Desna' and 'Sibir' classes to support the missile and space programmes.

The first of a new Soviet navy class for space tracking and communications, the 24,000-ton *Marshal Nedelin*, entered service in 1983. A second unit is building at the Admiralty Shipyard at Leningrad, which normally constructs submarines. These are the largest purpose-designed vessels of their type yet built, but the exact role for which they were produced is not yet clear, although a link with the Soviets' space shuttle programme may be possible. Like the other Soviet navy space event ships that serve in the Pacific Fleet, they carry a Kamov Ka-25 'Hormone-C' utility helicopter, a fact which distinguishes them immediately from civil vessels.

The largest of these vessels is the 45,000-ton *Kosmonavt Yuriy Gagarin*, which is based in the Black Sea. Built on a tanker hull, she is fitted with two massive 27-m (88.6-ft) diameter 'Ship Shell' and two 12.5-m (41-ft) diameter 'Ship Bowl' stabilized communications and tracking dish antennae. If these are all turned forward they act as brakes and reduce the ship's overall speed by 2 kts. The *Gagarin* is backed by the 17,500-ton *Kosmonavt Vladimir Komarov*, which is also homeported at Odessa. The *Komarov* is a converted bulk cargo ship that is fitted with two huge 'Ship Globe' and one smaller 'Ship Wheel' antennae in spherical radomes, two 'Quad Ring' arrays, a large multiple yagi antenna and two 'Vee Cone' HF communications aerials carried at the mastheads. In the Soviet Far East operates the 21,250-ton *Akademik Sergey Korolev*, which was completed in 1971 and has 80 laboratories of various types for research work. For her primary space tracking role she carries two 'Ship Bowl' dish antennae, a smaller version of the 'Ship Globe' antenna in a radome housing, and four 'Quad Ring' arrays with extensive HF communications systems.

Timber-carrier conversions

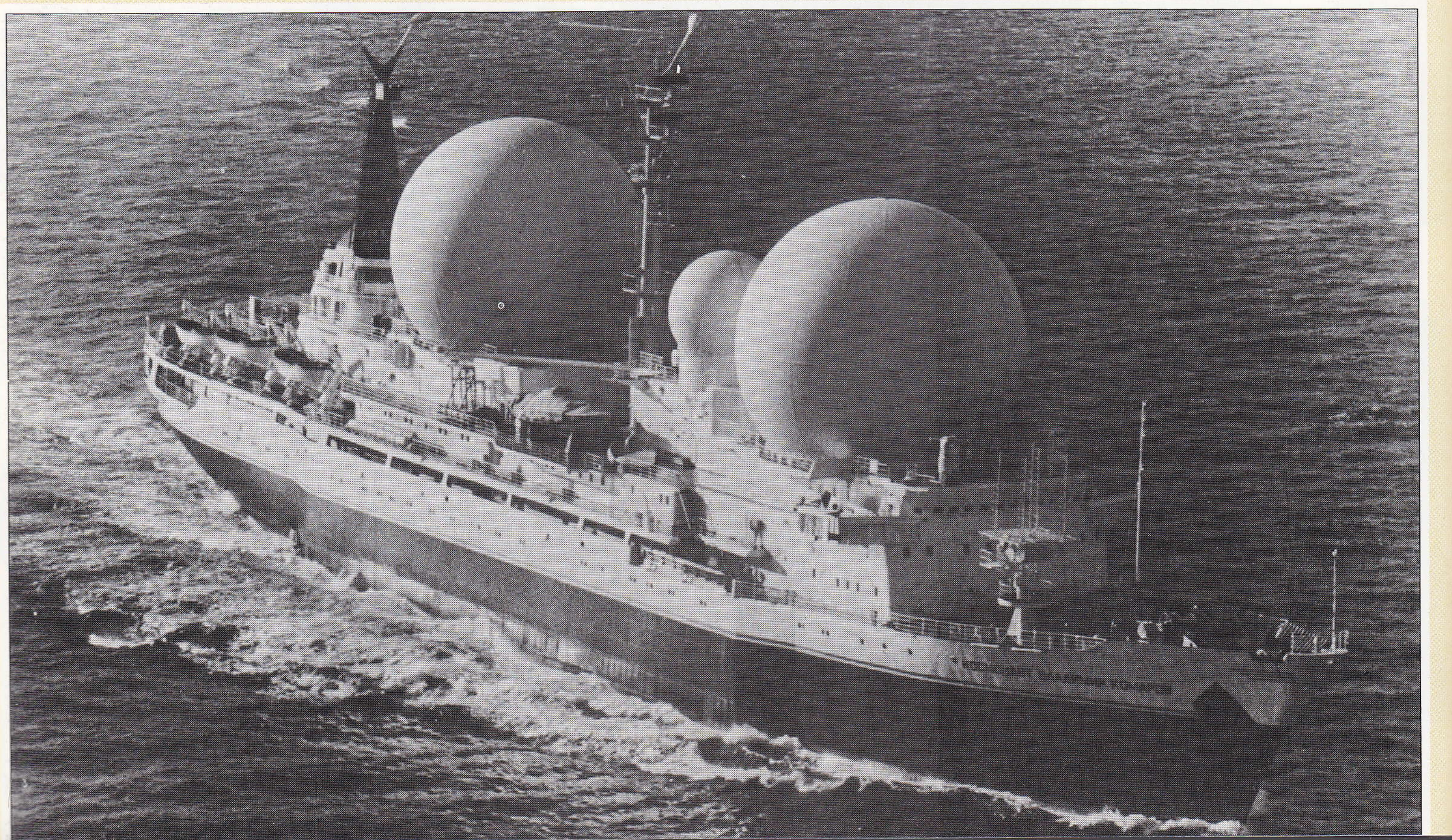
Conversions of 'Vytegrales' class timber carriers provide the remaining two classes of space event support ships. The less elaborately converted group is the four-vessel 7,600-ton 'Borovichi' class. Homeported in the Baltic, they retain the forward cargo hold of the merchantmen and carry one 'Quint Ring' and four 'Quad Ring' yagi arrays together with a 'Vee Cone' HF communications antenna. The remaining group, the four 5,970-ton 'Kosmonavt Pavel Belyayev' class ships, have extensively modified superstructures and are fitted with a large trainable quadruple-dish stabilized 'Quad Spring' communications array amidships as well as three smaller systems and a modified naval 'Kite Screech' fire-control radar.

The naval range instrumentation vessels already mentioned differ from the civil vessels in having different electronic systems based on naval radars. The two 14,065-ton 'Desna' class ships are the only vessels of the Soviet navy to carry a 'Head Net-B' air-search radar. They also have a large 'Ship Globe' tracking radar plus three smaller unidentified radars as part of their outfit. The four 7,800-ton 'Sibir' class ships each have either a 'Big Net' or 'Head Net-C' three-dimensional military radar (for tracking within the final splash-down phase of a test) with two or three of the smaller unidentified tracking radars from the 'Desna' class fitted forward. The electronic outfits can also be varied if required to suit the mission.

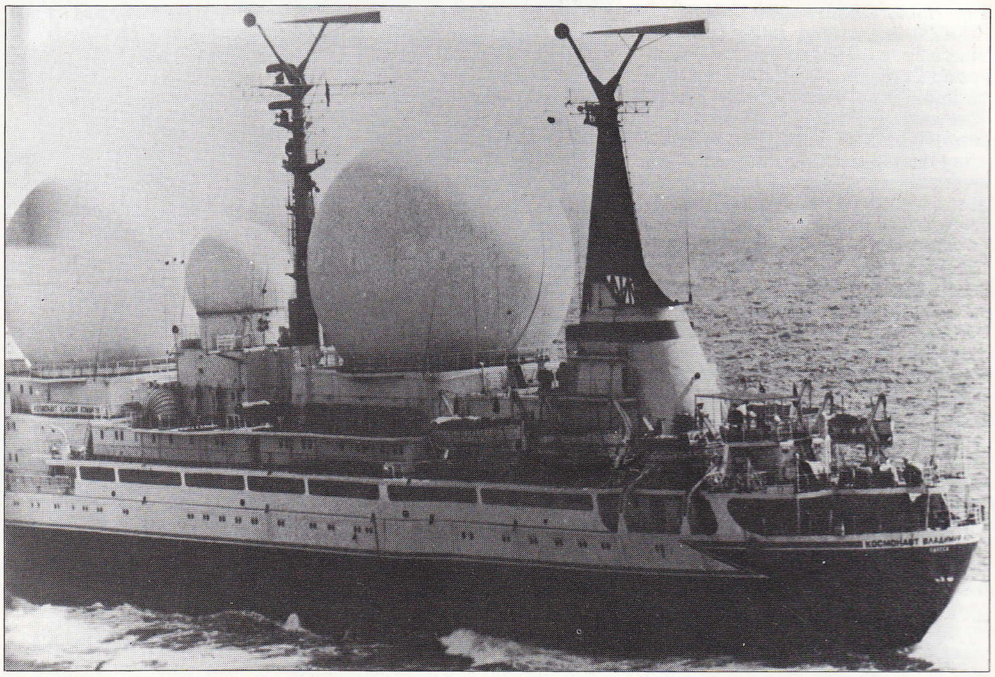
The naval vessels are usually found deployed in the Soviet Pacific Ocean SLBM and ICBM missile-testing areas, where they monitor closely the re-entry and impact phases in order to compute missile and warhead flight characteristics. One or more such ships are also believed to be involved in the Soviets' space shuttle programme (with several other ships) in order to evaluate the shuttle's flight performance details during the re-entry and final atmosphere glide phases. Their task will probably be taken over by the *Marshal Nedelin* in due course.

It is not known for certain if the navy ships operate off the coasts of the USA during the test firing of missiles, but it is likely that this task is left to the larger AGIs such as the 'Primor'ye' class, which can monitor the US signal and telemetry data output. Where they are known to have appeared, however, is around the American missile test range near Kwajalein atoll in the Pacific Ocean when ICBMs fired from Vandenburg Air Force Base impact their payloads. It is from the data gained by these ships that the Soviets can plan their defence networks and improve their own ICBM forces

Originally the dry cargo vessel Genichesk, *the* Kosmonavt Vladimir Komarov *was converted at Leningrad in 1967, and was named after the Soviet astronaut who died in a re-entry accident in that year.*

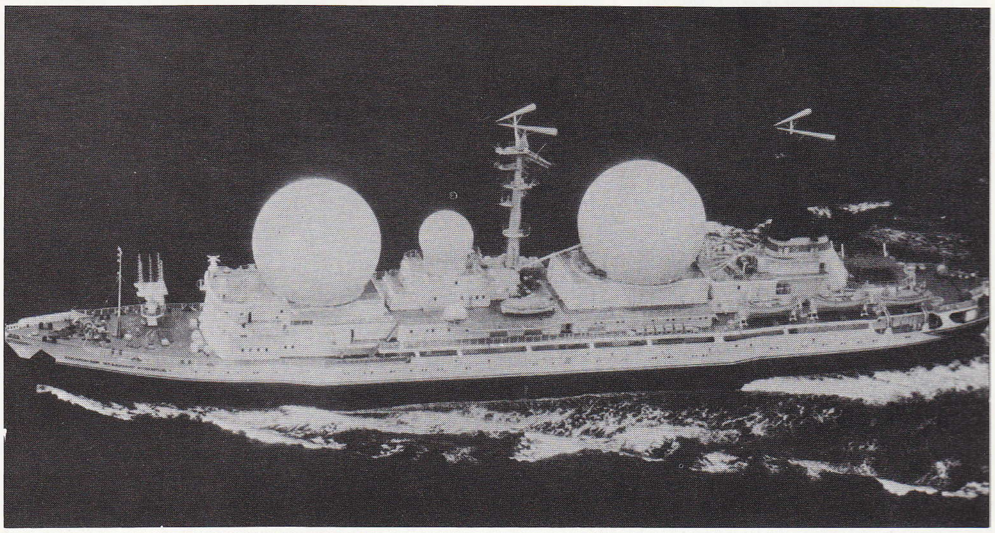


The spherical radomes on the Komarov *cover two 'Ship Globe' and a smaller 'Ship Wheel' satellite- and missile-tracking antennae. The 'Vee Cone' HF communications aerials at the mastheads show clearly why that particular NATO codename was chosen.*



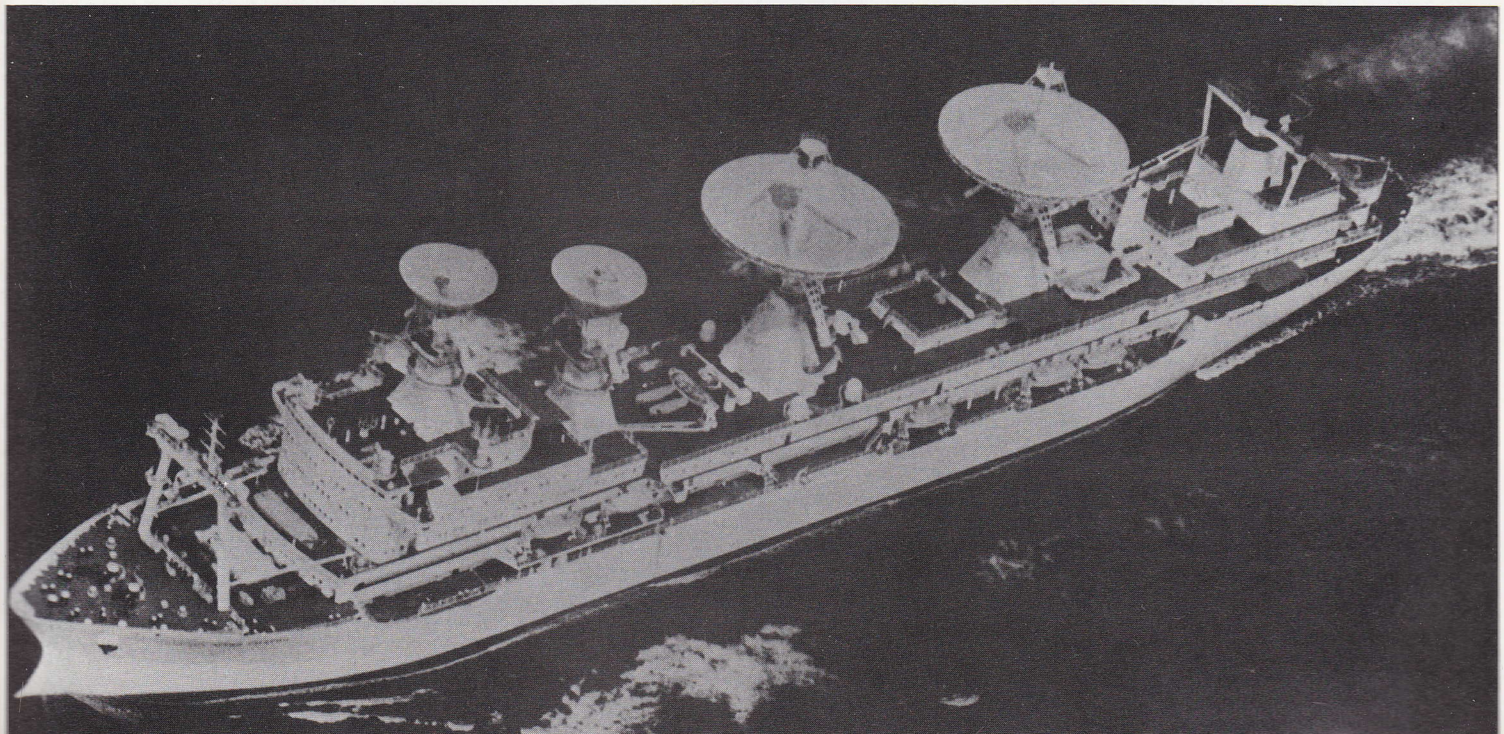
by altering such parameters as the re-entry vehicle shape and deployment pattern. The close monitoring of flight characteristics during re-entry gives a good idea of the system's accuracy, and measurement of a body's size and probable weight indicates the warhead's type and estimated yield. Such information can be used by the Soviets to upgrade the over-pressure that their missile silos can take during an attack in order to increase their survivability factor. Also, by studying the missile trajectory and its different phases of stage separation, bus deployment and warhead MIRVing, the best interception points for endo- and exo-atmospheric ABMs can be predicted, as can those for the more exotic 'star wars' laser and particle-beam systems which the Soviets are known to be researching.

For the civilian ships the major projects of the future must be the planned Soviet space station of greater size than the current Salyut series, and the probable interplanetary manned flights that are believed to be scheduled for the late 1990s. In both cases the space control and communications relay tasks become of vital importance when the craft are out of contact with their normal control centres, especially if things go wrong, as the ships can manoeuvre to new stations whereas ground-based stations are tied to one location.



Right: Atop the bridgehouse two 'Quad Ring' arrays (looking rather like capstans) can be seen, while in contrast the futuristic shape of the large multiple yagi communications antenna can be seen on its bandstand at the starboard side of the foredeck.

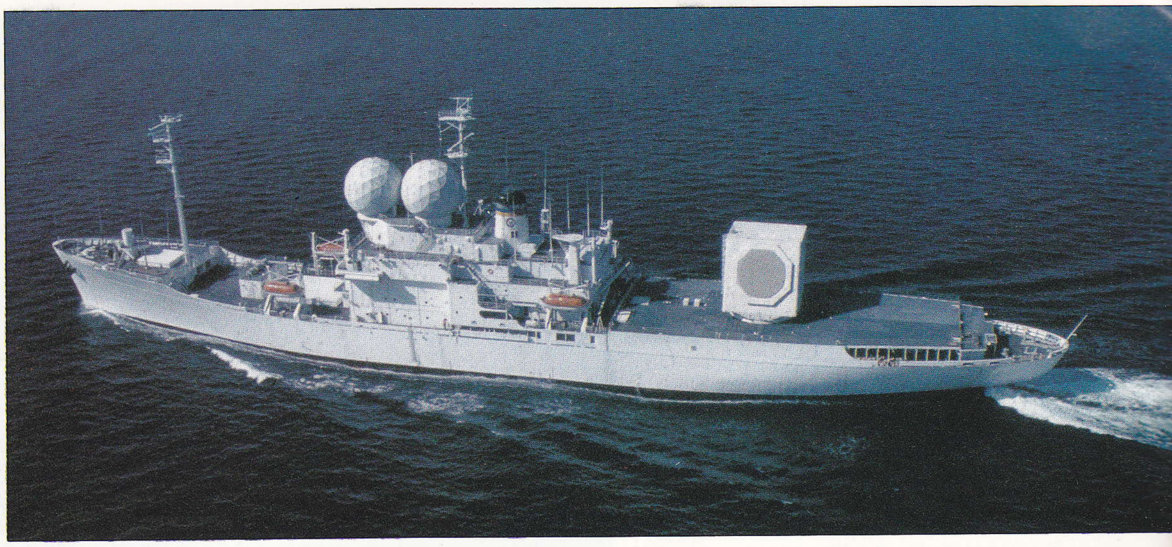
Below: The size of the Gagarin *allows much larger and more powerful equipment to be fitted than in similar vessels. The smaller of the pairs of dishes carried on the superstructure are 12.5 m (41 ft) in diameter, while the larger pair are a massive 27 m (88.6 ft) across.*



USA

'Converted Compass Island' class

The USNS ***Observation Island*** (T-AGM23) is a former ballistic missile trials ship that was modified as a **'Converted Compass Island' class** range instrumentation ship during 1979-81. This was specifically for the purpose of carrying SPQ-11 'Cobra Judy' phased-array missile-tracking radar aft to collect data on Soviet and Chinese ballistic missile tests. Operated for the USAF Eastern Space Missile Center in the Pacific area by the Military Sealift Command, she is painted white. Two large parabolic signal-collection antennae are fitted beneath the pair of geodesic radomes atop the bridge. An extensive communications fit, which includes satellite receivers and transmitters, allows for the real-time transmission of raw and analysed data to distant shore stations if required. During her original career as a missile trials ship she fired the first ship-launched Polaris missile at sea on 27 August 1959 and then, following a refit in 1969, the first Poseidon missile on 16 December 1969. The massive 'Cobra Judy' radar carried is very similar in operational aspects to the even larger land-based 'Cobra Dane' radar, the phased transmissions allowing the system to detect and track objects at a very fast rate. The installation aboard the *Observation Island* weighs about 250 tons, and the radar itself is located in a mechanically-rotated pyramid-like steel structure, with the data analysis and storage computers (plus the display consoles) in compartments on the decks beneath it.



The large phased-array radar turret mounted on USNS* Observation Island *when working in concert with the similar system based on land in Alaska is capable of simultaneously tracking up to 200 missile targets.

Specification

'Converted Compass Island' class

Displacement: 13,060 tons light and 17,015 tons full load

Dimensions: length 171.9 m (564.0 ft); beam 23.2 m (76.0 ft); draught 7.6 m (25 ft)

Propulsion: geared steam turbines delivering 14355 kW (19,250 hp) to one shaft

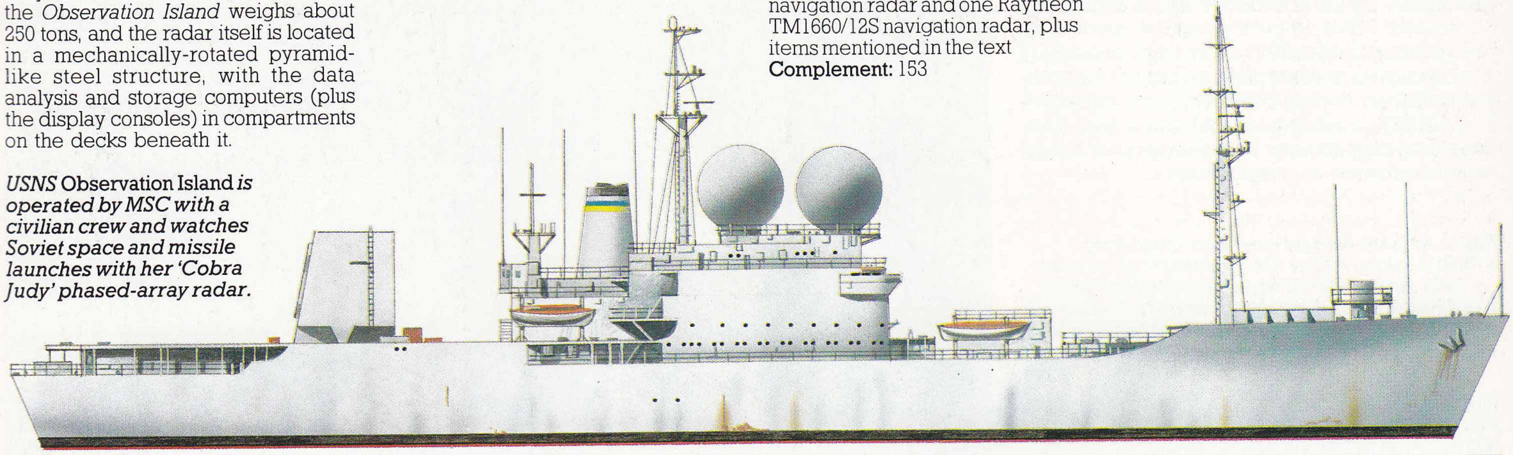
Speed: 20 kts

Aircraft: none

Armament: none

Electronics: one Raytheon TM1650/9X navigation radar and one Raytheon TM1660/12S navigation radar, plus items mentioned in the text

Complement: 153

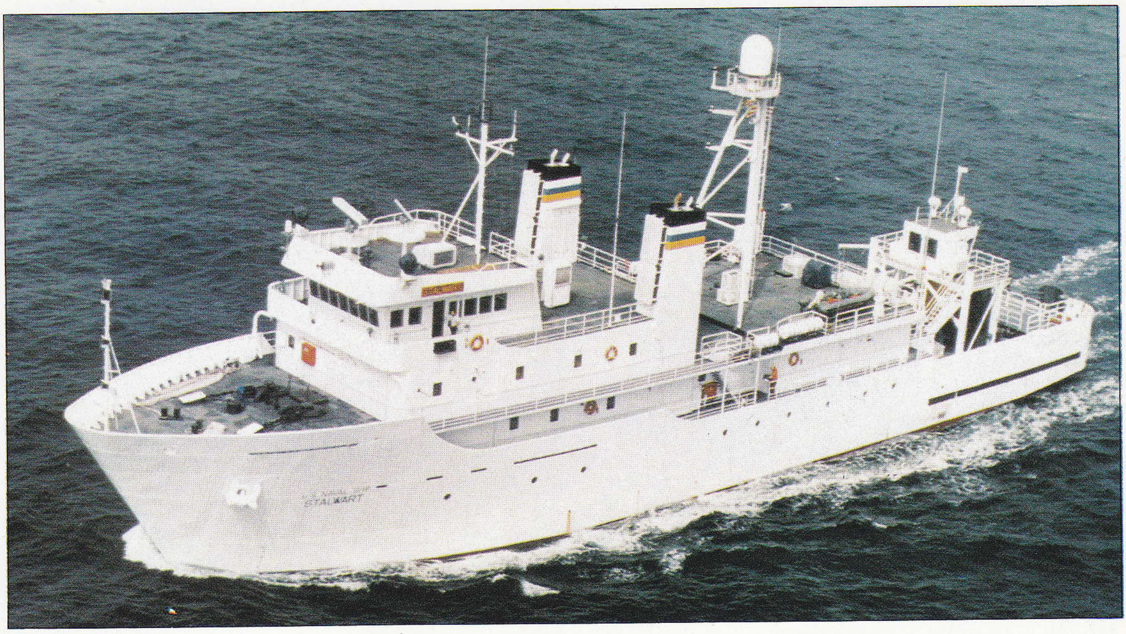


USNS* Observation Island *is operated by MSC with a civilian crew and watches Soviet space and missile launches with her 'Cobra Judy' phased-array radar.

USA

'Stalwart' class

The 18 vessels of the **'Stalwart' class** are to provide the gap-filling role for the American Sound Surveillance Under Sea (SOSUS) system in areas where there is no or only poor coverage. The sonar used by the 'Stalwarts' is the Surveillance Towed Array Sensor (SURTASS): this is a 1829-m (6,000-ft) long linear passive hydrophone array which is deployed over the ship's stern in a flexible, neutrally buoyant cable housing. The data picked up by the array is then instantaneously relayed to a shore monitoring station for processing and evaluation via a WSC-6 satellite communications link. The first seven ships are the USNS ***Stalwart*** (T-AGOS1), ***Contender*** (T-AGOS2), ***Vindicator*** (T-AGOS3), ***Triumph*** (T-AGOS4), ***Assur-***

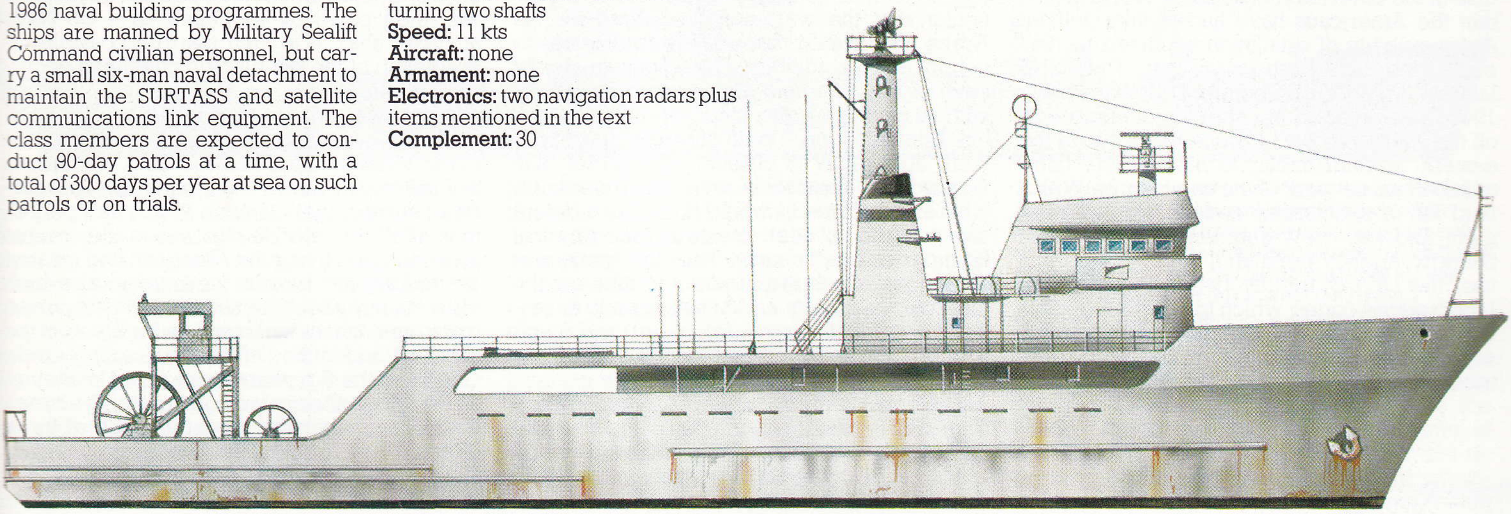


Unlike many ASW surveillance vessels, the 'Stalwart' class has no capacity for analysing data on board. Information picked up by the 1.8-km (1.2-mile) towed sonar array is transmitted via satellite to a ground station for further processing and action.

ance (T-AGOS5), ***Persistent*** (T-AGOS6) and ***Indomitable*** (T-AGOS7), and all have been completed; the USNS ***Prevail*** (T-AGOS8), ***Assertive*** (T-AGOS9), ***Invincible*** (T-AGOS10), ***Dauntless*** (T-AGOS11) and ***Vigorous*** (T-AGOS12) are building, and the remaining six are projected in batches of three under the Fiscal Years 1985 and 1986 naval building programmes. The ships are manned by Military Sealift Command civilian personnel, but carry a small six-man naval detachment to maintain the SURTASS and satellite communications link equipment. The class members are expected to conduct 90-day patrols at a time, with a total of 300 days per year at sea on such patrols or on trials.

Specification
'Stalwart' class
Displacement: 1,650 tons light and 2,285 tons full load
Dimensions: length 68.3 m (224.0 ft); beam 13.1 m (43.0 ft); draught 4.6 m (15.1 ft)
Propulsion: four diesels delivering 2386 kW (3,200 hp) to electric drives turning two shafts
Speed: 11 kts
Aircraft: none
Armament: none
Electronics: two navigation radars plus items mentioned in the text
Complement: 30

The 'Stalwart' class is being used by the US Navy to carry and tow a long-range passive sonar system that is designed to help fill the gaps in the SOSUS underwater monitoring network around the coasts of the USA and fellow NATO nations.

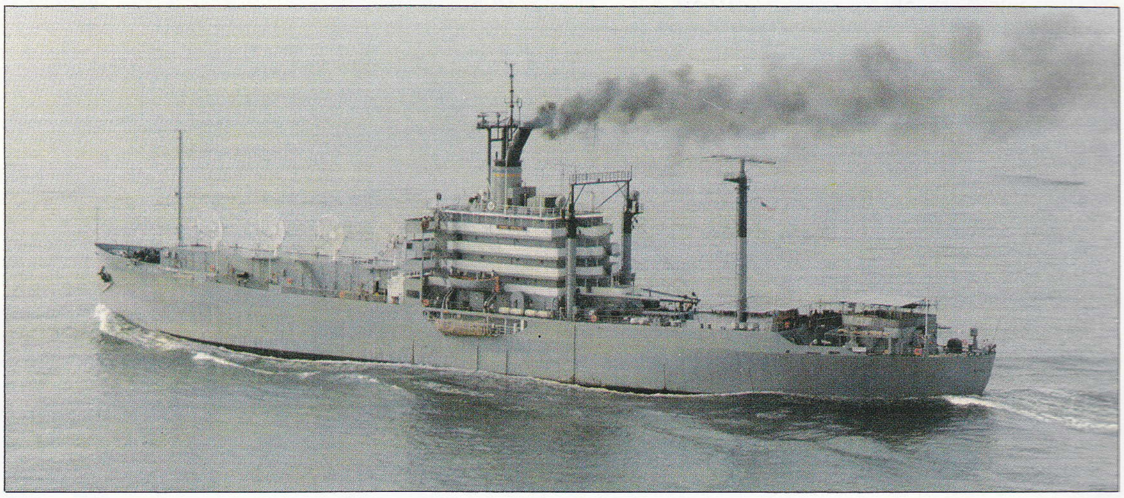


USA

'Converted Haskell' class

The USNS ***Range Sentinel*** (T-AGM22) is a **'Converted Haskell' class** attack transport developed for specific use as a range instrumentation ship, to monitor first the Poseidon and then the Trident I/II SLBM development programmes. Converted from October 1969 to October 1971, the *Range Sentinel* operates as a unit of the US Navy's Military Sealift Command (MSC) fleet. She is fitted with an SPQ-7 and three other radar tracking systems on a single-deck superstructure laid over the forward cargo hold area. Since commissioning for this role the *Range Sentinel* has had several electronic equipment updates, and these have resulted in changes of appearance over the years.

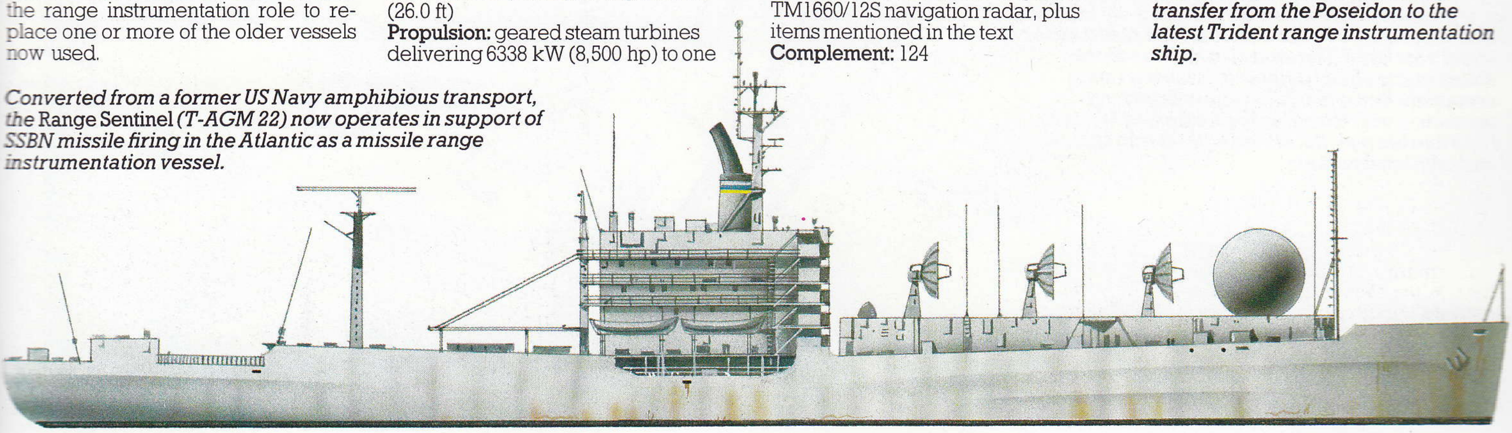
There was also a second vessel of similar design converted from a **'Victory' class** merchant ship, the USNS ***Wheeling***, which has now been struck off the naval register. The reason for the similarity is that the *Range Sentinel* has the VC2-S-AP5 'Victory' type hull design and propulsion plant. Under current planning, the US Navy intends in the Fiscal Year 1987 budget allocation to convert another large vessel to the range instrumentation role to replace one or more of the older vessels now used.



Specification
'Converted Haskell' class
Displacement: 8,853 tons light and 12,170 tons full load
Dimensions: length 138.7 m (455.0 ft); beam 18.9 m (62.0 ft); draught 7.9 m (26.0 ft)
Propulsion: geared steam turbines delivering 6338 kW (8,500 hp) to one shaft
Speed: 15.5 kts
Aircraft: none
Armament: none
Electronics: one Raytheon TM1650/9X navigation radar and one Raytheon TM1660/12S navigation radar, plus items mentioned in the text
Complement: 124

Originally commissioned in 1944, the converted attack transport Range Sentinel *is based upon a 'Victory' ship hull, and is used in the SLBM test programmes. The forward radome has recently been lost following transfer from the Poseidon to the latest Trident range instrumentation ship.*

Converted from a former US Navy amphibious transport, the Range Sentinel *(T-AGM 22) now operates in support of SSBN missile firing in the Atlantic as a missile range instrumentation vessel.*



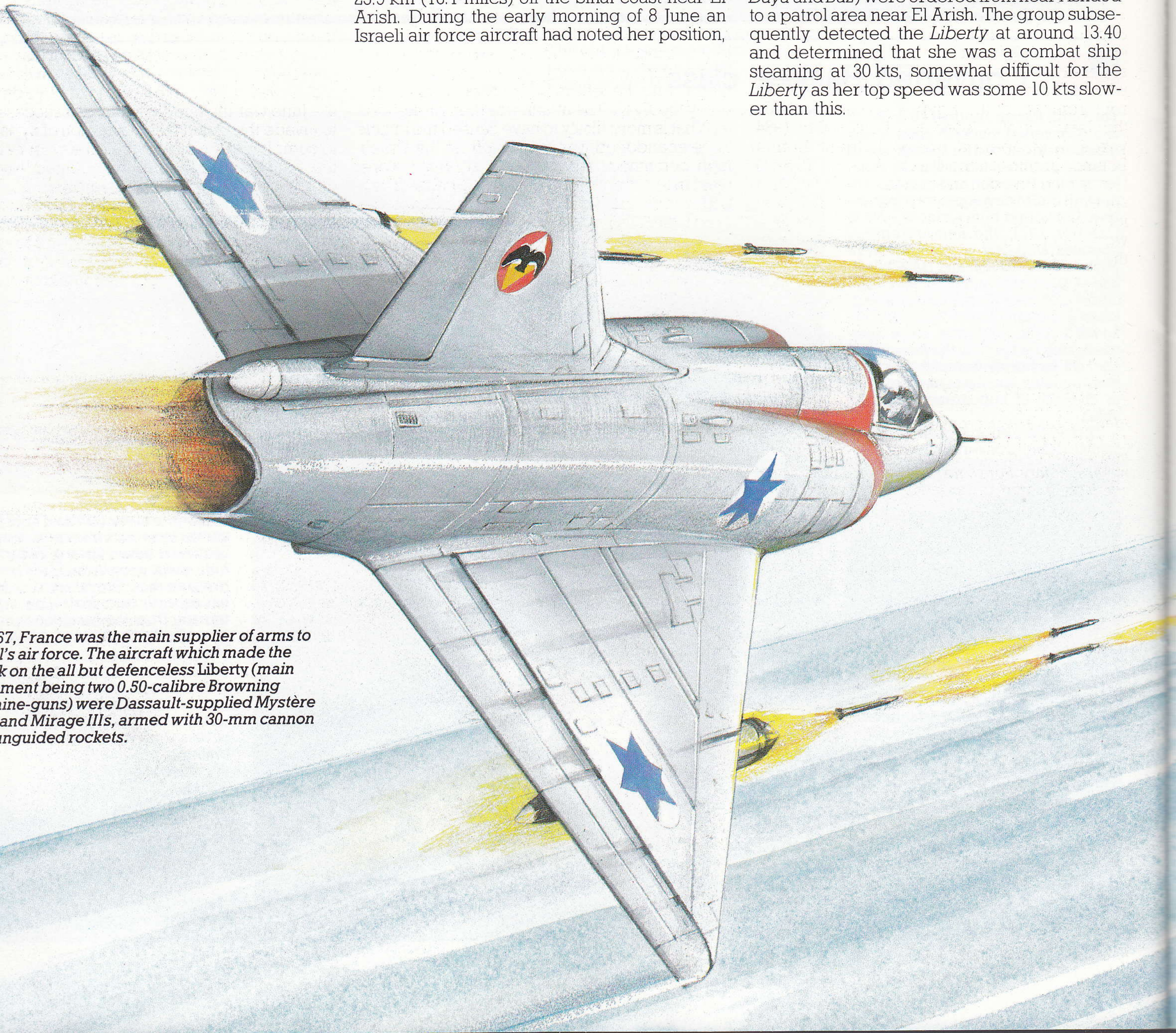
The Attack on the *Liberty*

***Superpower involvement in the Middle East has never been particularly rewarding, old enmities far outweighing any transient economic dependence. Such is the volatility of the region that a careful watch must be kept, and it was at the height of the Six Day War that the US Navy had an eavesdropper in the eastern Mediterranean in the shape of USNS* Liberty.**

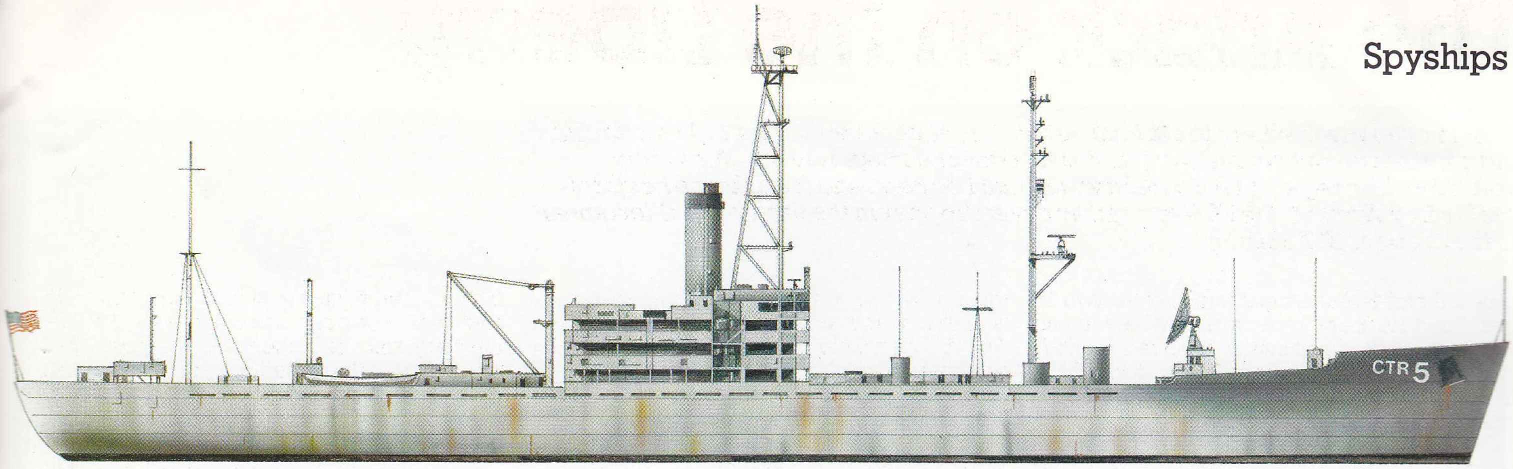
One of the bitterest attacks since World War II that the Americans have had to take without any possibility of retaliation occurred in 1967 during the third Arab-Israeli war. The USNS *Liberty*, a converted freighter built in the early 1940s, was diverted from her Sigint operations off the western coast of Africa to appear in the eastern Mediterranean to monitor the communications network of the combatants. With a hold full of specialized codebreaking equipment and her crew augmented by National Security Agency personnel well versed in its use, the *Liberty* rapidly began to break the Israeli secret codes, which told the Americans that Israel had herself begun intercepting messages passing between the various Arab countries, changing the text of some and then rerouting them to convince the Jordanians in particular that the war was going well for the Arabs. This would then enable the Israelis to continue their military operations to defeat each of the adjoining Arab countries in turn, without having to fight offensively on more than one front at a time. These offensive operations were apparently in violation of a secret plan worked out previously with the Americans, whereby the Israelis would fight only a defensive war and not seek to extend their physical boundaries by conquest. Thus the scene was set for the Israeli requirement to take out the threat of the *Liberty* and her electronic eavesdropping.

Liberty sighted

The opportunity to do this presented itself on Thursday 8 June, the fourth day of the war. The *Liberty* was steaming north eastwards some 25.9 km (16.1 miles) off the Sinai coast near El Arish. During the early morning of 8 June an Israeli air force aircraft had noted her position, initially identifying the ship as a destroyer. She was then correctly identified as a US Navy auxiliary ship. It is then that the possible intervention of the Israeli high command occurred, as later during the morning further attempts were made to identify the ship positively, the vessel finally being reported as a cargo vessel around mid-morning. According to Americans aboard the *Liberty* she was carrying correct identification codes and panellings at all times while she was in the combat zone, and also flying the American flag clearly. By midday the Israelis were again at a high state of alert about the ship as it was reported that troops ashore had come under fire from the sea, and unidentified intelligence sources indicated that the Egyptians were about to attempt a possible seaborne landing behind the Israeli lines. To counter this threat a group of three 62-ton French-built fast attack craft (*Ayah, Daya* and *Baz*) were ordered from near Ashdod to a patrol area near El Arish. The group subsequently detected the *Liberty* at around 13.40 and determined that she was a combat ship steaming at 30 kts, somewhat difficult for the *Liberty* as her top speed was some 10 kts slower than this.



In 1967, France was the main supplier of arms to Israel's air force. The aircraft which made the attack on the all but defenceless Liberty *(main armament being two 0.50-calibre Browning machine-guns) were Dassault-supplied Mystère IVAs and Mirage IIIs, armed with 30-mm cannon and unguided rockets.*



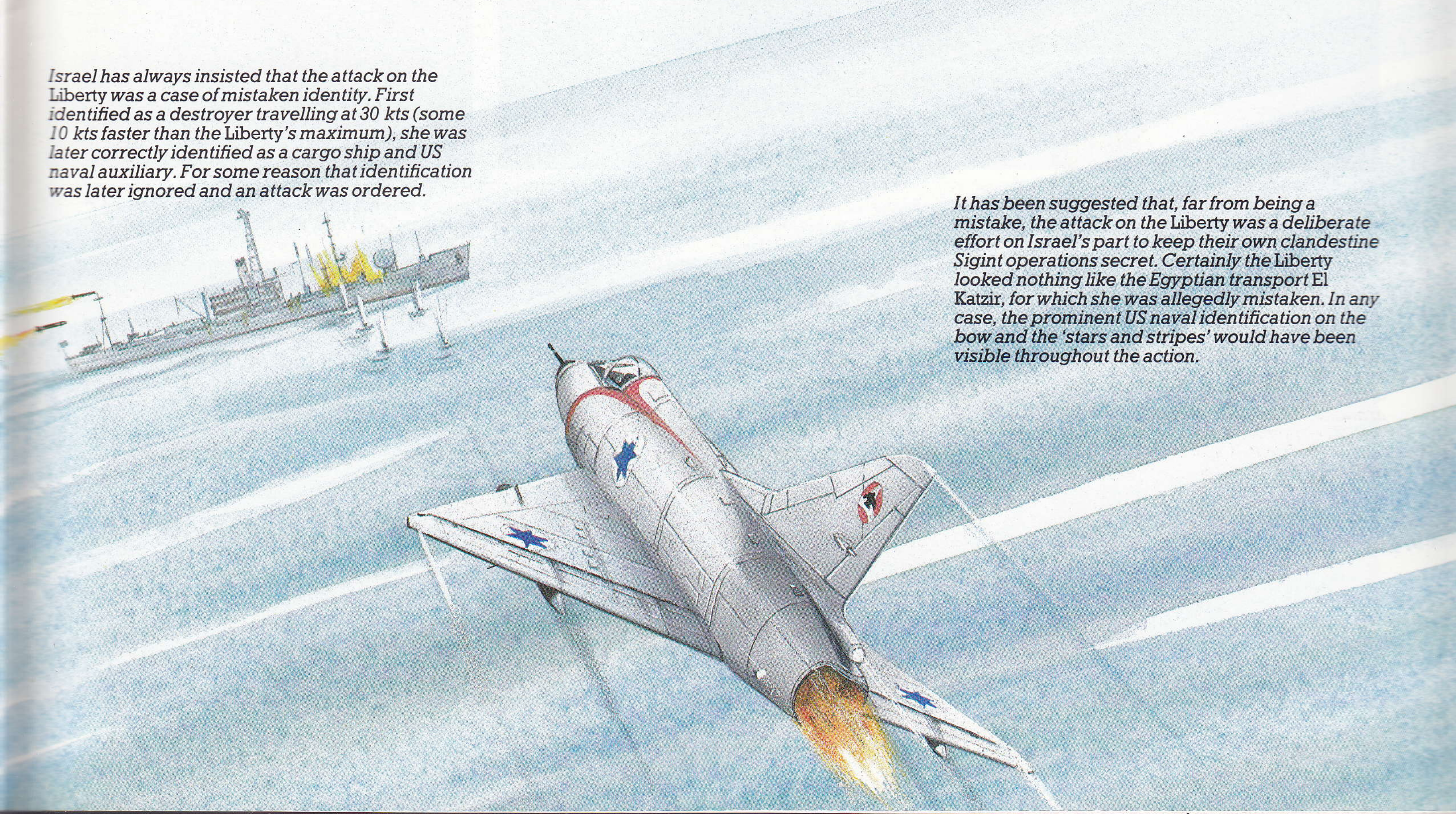
Converted from a wartime 'Victory' cargo vessel, the Liberty *retained much of her former profile, with the addition of extra antennae being the only indication of her new clandestine role. It is difficult to imagine such a vessel being mistaken for any kind of warship, but this is what the Israelis claimed to have done.*

The group commander then called for air support and at 14.00 the *Liberty* was strafed and rocketed by two Dassault Mystère IVAs and then by two Dassault Mirage III fighters two minutes later. After six minutes of air attack the ship was on fire in several places and according to the Israelis slowed down sufficiently for the 42-kt fast attack craft to catch her. By 14.23 they were only 6.4 km (4 miles) from the target, with the burning vessel transmitting 'AAA' on the radio, requesting the Israeli craft to identify themselves. Manoeuvring even closer to the ship, the Israeli commander decided that she was the Egyptian military cargo ship *El Katzir*, a decision somewhat difficult to understand as even allowing for obscuration of some of the superstructure by smoke, the size and profile which *Liberty* presented was completely different from that of the Egyptian vessel. At 14.00 the Israeli craft closed to about 900 m (984 yards) and opened fire with their 40-mm Bofors, 20-mm cannon and 12.7-mm (0.5-in) heavy machine guns into the *Liberty*'s hull and superstructure, raking it repeatedly. This was followed with a torpedo attack by the *Baz*, which launched two 457-mm (18-in) weapons at the *Liberty*'s bows from 900 and 500 m (984 and 547 yards) respectively. Luckily both torpedoes missed, but the *Liberty* was then struck in the hold area a minute later by one of two torpedoes from the *Ayah*. These had been launched directly at the ship, at an angle of 90°, from a distance of 1800 m (1,969 yards). The explosion of the weapon blew a hole some 12 m (40 ft) wide in the hull, causing most of the fatalities aboard the *Liberty*. The *Daya* then attacked with a fifth torpedo but also missed from a range of 1400 m (1,531 yards). Because of the very poor torpedo launches the Israeli commander ordered one of the boats to outflank the *Liberty* and attack from the other side. During this manoeuvre the Israeli craft saw the identification letters on the bow of the badly listing ship, and shortly afterwards a rubber liferaft with the letters US Navy on it was sighted by the *Ayah*. The attack was then broken off.

What is more likely to have caused the attack to be abandoned was an order from the Israeli high command, whose Sigint services were monitoring the signals from the *Liberty*. They had heard the *Liberty*'s SOS to the nearest American carrier battle group requesting air support and the reply saying it was on the way together with the cruiser USS *Little Rock*. The two vessels met as the *Liberty*, with her fires then extinguished, was limping towards Malta and the drydock facilities there.

However, the Israelis had achieved their purpose in removing the *Liberty* from the scene, albeit at a cost of 34 officers and men of the *Liberty*'s crew dead with a further 164 injured to varying degrees. The Israelis subsequently blamed the Americans for not telling them about the *Liberty*'s operation and position, but they did express regret and pay some compensation for the 'accident'. It is worth noting, however, that in the remaining two days of the June war the Israelis managed successfully to invade the Golan Heights region of Syria and to complete the occupation of the west bank of the Jordan river before any United Nations ceasefire was brought into being.

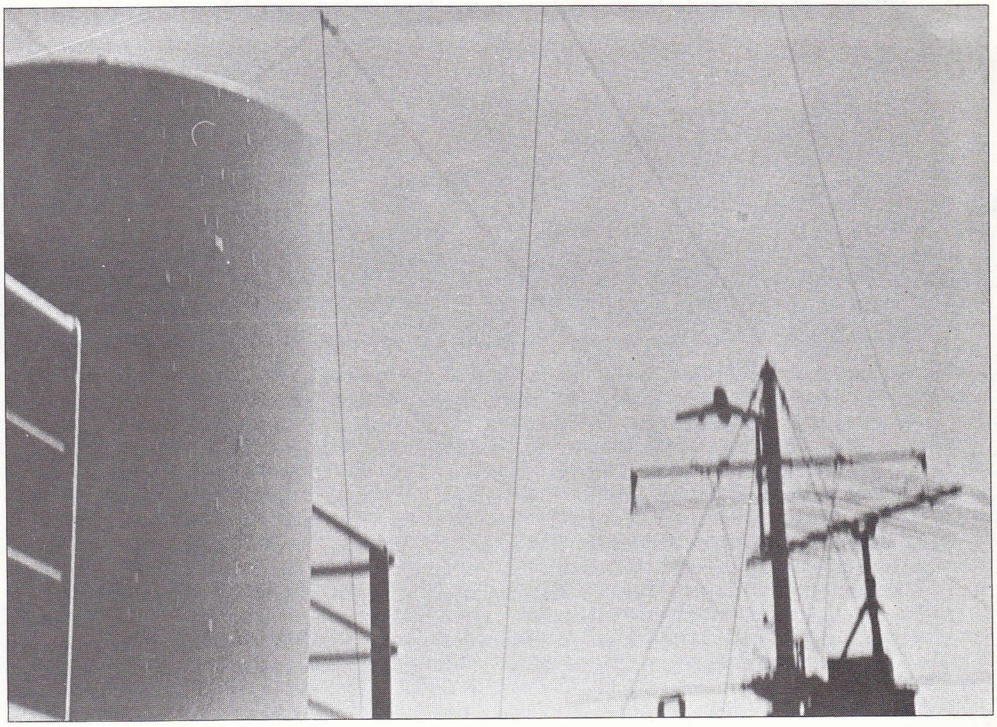
In subsequent years the *Liberty* incident was played down considerably in the USA by both the military and the politicians, so aid to Israel was affected very little. But the lessons for the US Navy and the intelligence community about



Israel has always insisted that the attack on the Liberty *was a case of mistaken identity. First identified as a destroyer travelling at 30 kts (some 10 kts faster than the* Liberty*'s maximum), she was later correctly identified as a cargo ship and US naval auxiliary. For some reason that identification was later ignored and an attack was ordered.*

It has been suggested that, far from being a mistake, the attack on the Liberty *was a deliberate effort on Israel's part to keep their own clandestine Sigint operations secret. Certainly the* Liberty *looked nothing like the Egyptian transport* El Katzir, *for which she was allegedly mistaken. In any case, the prominent US naval identification on the bow and the 'stars and stripes' would have been visible throughout the action.*

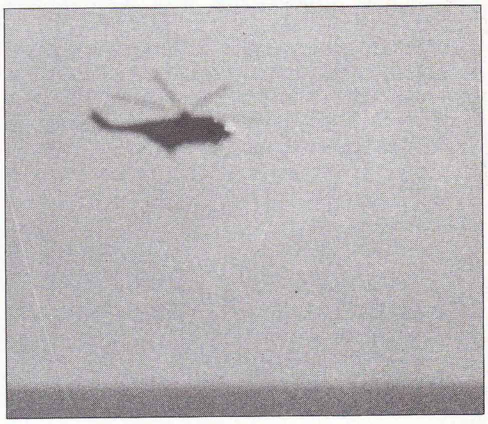
using vessels so close to a sensitive area were not immediately learned, as the incident with the USS *Pueblo* in the following year revealed. The *Pueblo* was a relatively small Sigint auxiliary tasked with sailing close to North Korean territorial waters to monitor communications ashore. On 22 January 1968 she was surrounded by North Korean patrol boats and after a short exchange of fire was boarded and taken to Wonsan harbour as the first US ship of war to be boarded and surrendered since the Anglo-American War of 1812. In contrast with their *Liberty* response, the Americans mobilized six Naval Air Reserve squadrons and created Task Force 71 with the nuclear carrier USS *Enterprise* as its flagship (the *Enterprise* was already heading for her third combat cruise off Vietnam). A retaliatory air strike by the *Enterprise*'s carrier air group was thought likely, but the idea was abandoned when the *Pueblo* was towed into Wonsan. The task force was ordered to remain in the area until the situation had been resolved, although the *Enterprise* was relieved by the USS *Kitty Hawk* on 6 February. The *Pueblo* and her crew were eventually released, but this and the previous *Liberty* incident spelled the end of the AGI in the US Navy inventory, AGI missions being taken over by regular warships and submarines.



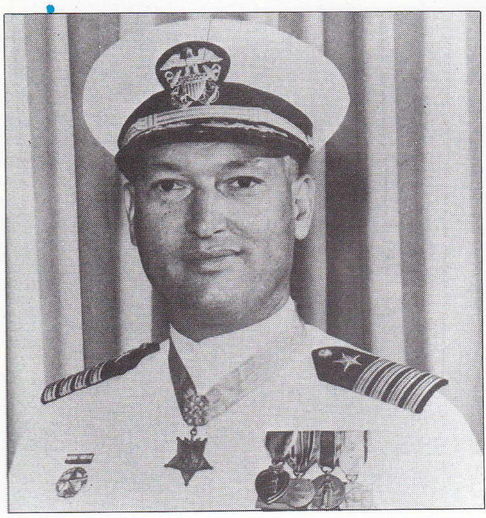
Above: The first strafing pass was made at 14.00 by two Mystères, followed two minutes later by two Mirages. As the photograph demonstrates, the attacks were at very low level.

Below: After attacking with gunfire, the three Israeli patrol boats closed in with torpedoes. This is probably the Baz *at about 14.42, when she launched a torpedo from 500 m (and missed).*

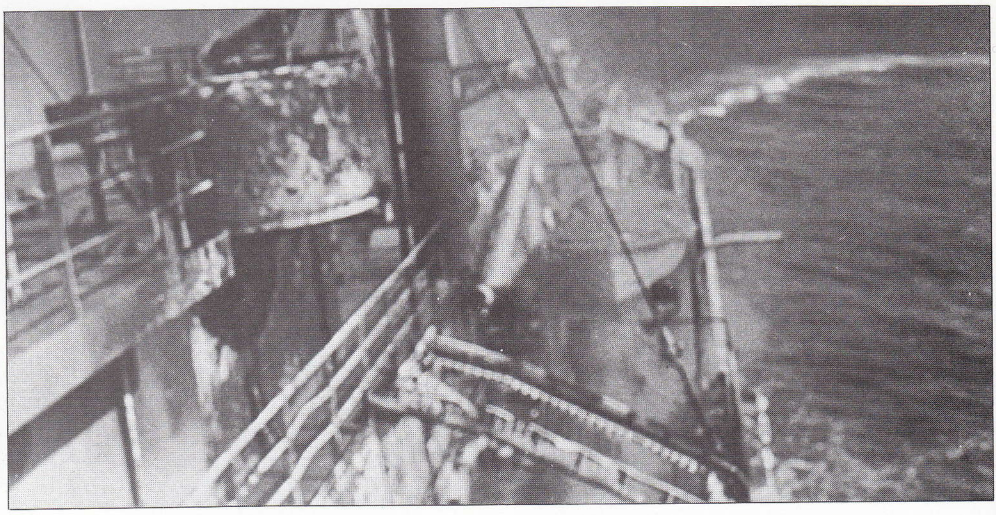
Below: After the attack, Israel sent helicopters to offer assistance, but not surprisingly they were not well received. This Frelon is circling the Liberty *after offering help.*



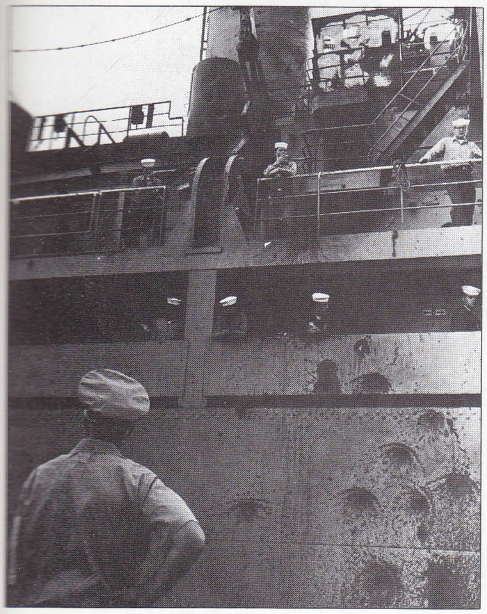
Below: Commander William McGonagle, skipper of the Liberty *after receiving the Medal of Honor.*



Below: Liberty *under attack. When the wounded McGonagle was asked by the Israelis if he required assistance, his less than polite (but understandable) reply was 'Go to hell, you bastard!'.*

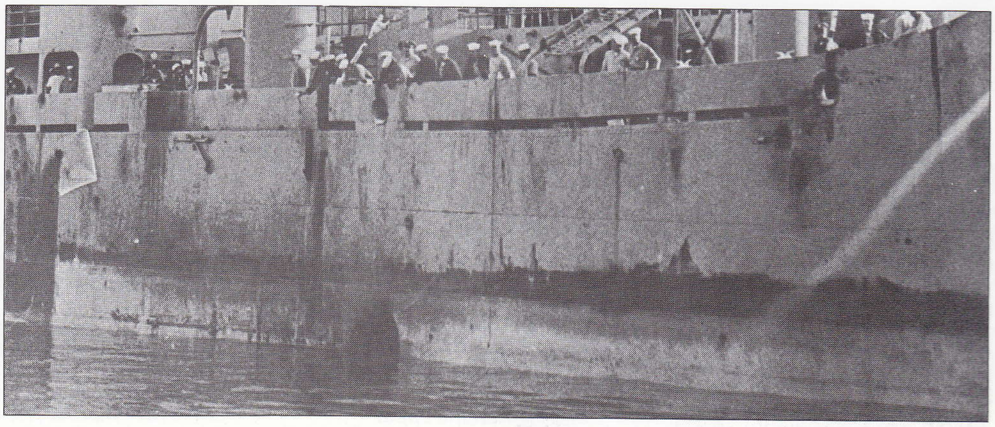


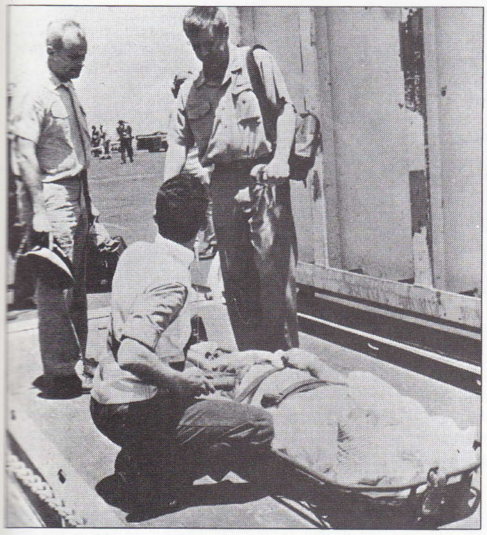
Right: Liberty *as she appeared before the attack. She would have appeared much the same to the Israeli air force pilots making the initial sighting on the morning of Thursday, 8 June.*



Left: After the attacks, the Liberty *was holed like a sieve. Holes had been punched by 12.7-mm, 20-mm, 30-mm and 40-mm cannon as well as by the 68-mm air launched rockets.*

Below: Liberty *took 821 separate machine-gun, cannon and rocket hits, but most serious was the massive hole blown by a torpedo strike below the waterline.*





Left: A wounded crewman is evacuated. The ship suffered 34 dead including the executive officer, and 164 wounded, including the captain. Most of the dead were due to the torpedo hit.

Below: The battered Liberty, *limping towards Malta, was met by the cruiser USS* Little Rock *and elements of the 6th Fleet. She was so badly damaged that she was scrapped.*

USA

'Vanguard' class

The USNS *Redstone* (T-AGM20) is the surviving range instrumentation member of the three-ship **'Vanguard' class** following the striking of the *Mercury* from the navy list and the conversion of the *Vanguard* into the US Navy's test ship for fleet ballistic missile guidance and ship navigation systems. Converted between 1964 and 1966 from a Type T2-SE-A2 tanker (by inserting a 22-m/72.2-ft extension amidships) to serve as the tracking and communications ship for the NASA Apollo lunar manned spaceflight programme, she now operates in support of the US Air Force's Eastern Space Missile Center at Patrick Air Force Base, Florida. To fulfil her current missions she is fitted with two large communications dish antennae and two tracking radars, plus a number of HF communications systems. To monitor upper-atmosphere conditions which might affect her work she has a high-altitude meteorological balloon hangar and launch platform located aft. Approximately 450 tons of electronic equipment are installed to support the radars and communications antennae; most of this is below decks in converted hold areas. It is likely that the *Redstone* will be the first ship to be replaced by the new range instrumentation ship conversion to be procured in the Fiscal Year 1987 programme.

Specification

'Vanguard' class

Displacement: 16,882 tons light and 24,710 tons full load

Dimensions: length 180.7 m (593.0 ft); beam 22.9 m (75.0 ft); draught 7.6 m (25.0 ft)

Propulsion: geared steam turbines delivering 6488 kW (8,700 hp) to an electric drive turning one shaft

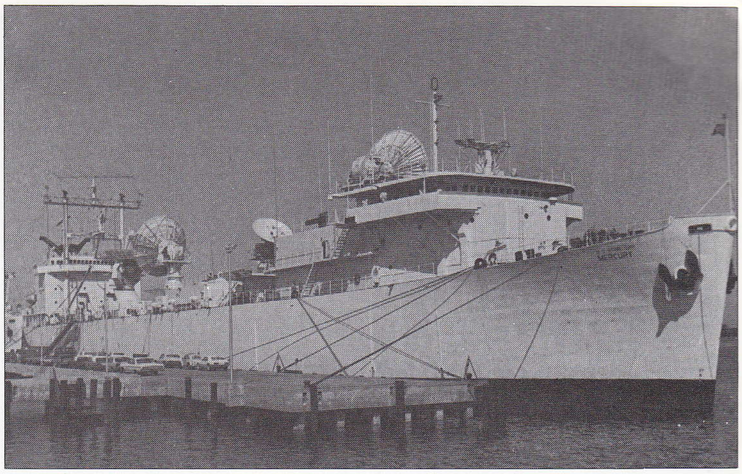
Speed: 16 kts

Aircraft: none

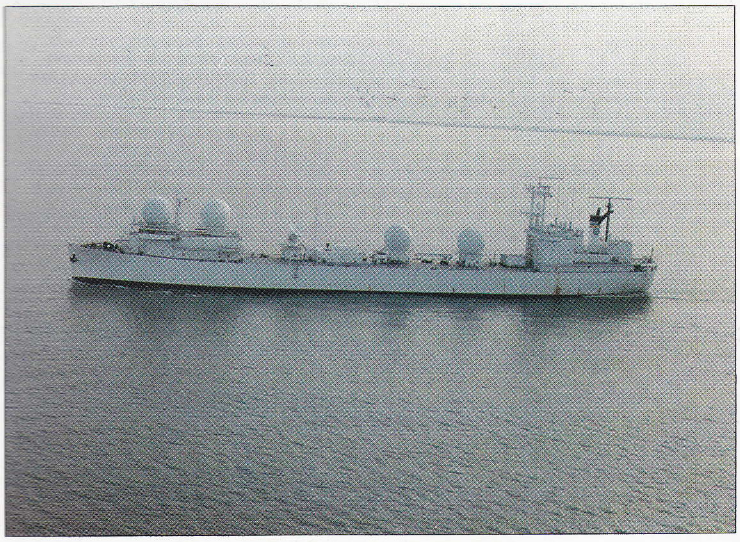
Armament: none

Electronics: one Raytheon TM1650/9X navigation radar and one Raytheon TM1660/12S navigation radar, plus items mentioned in the text

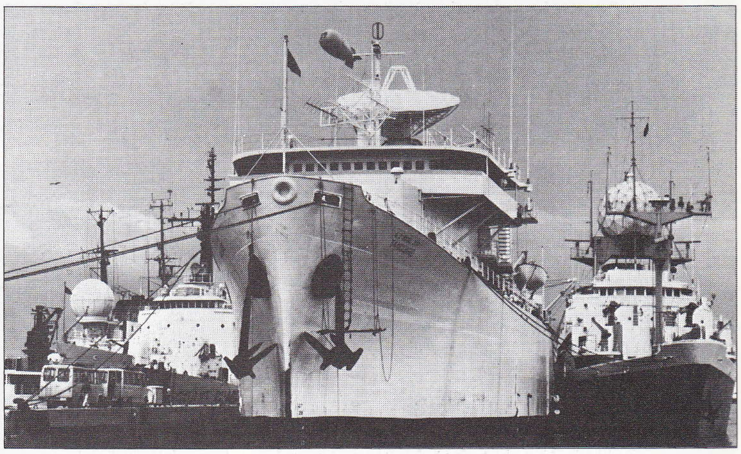
Complement: 198



Above: USNS Mercury *is the only one of the three converted 'Mission' class tankers to have been struck from the navy list. The vessels were named after early US missile programmes, and were used during the manned space programme for tracking and communications relay tasks.*



Above: USNS Redstone *operates in support of the Trident fleet ballistic missile programme, serving as a tracking and communication ship. She also has some upper atmosphere meteorology capability, essential for the analysis of missile performance.*



Above: The Vanguard *(T-AG 194) has taken part in a number of international upper atmosphere research exercises, including the GATE programme. Her sister ship* Redstone *(T-AGM20) now serves as the US Navy's navigation research ship, testing new systems.*

Below: Vanguard *(T-AG 194, formerly T-AGM19) supported the USAF missile-testing range in the Atlantic for a number of years, and is now temporarily laid up after conversion to ballistic missile guidance and ship navigation test ship in 1980.*